EXPRESS5800/120Rb-1

User's Guide

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CONTENTS

Using This Guide

Welcome to the NEC Express5800/120Rb-1 server User's Guide. This User's Guide provides a quick reference to information about your server system. Its goal is to familiarize you with your system and the tasks necessary for system configuring and upgrading.

This guide contains the following information:

- Chapter 1, **"**System Overview" provides all the information necessary to use the server, including a description your system's major system components. See this chapter to familiarize yourself with your system and how to use it.

- Chapter 2, "Setting Up Your System" tells you how to select a site, unpack the system, assemble the rack-mount subsystem, make cable connections, and power on your system.

- Chapter 3, "Configuring Your System" tells you how to configure the system and provides instructions for running the BIOS Setup Utility and the Adaptec Configuration Utility, which is used to configure SCSI devices in your system. This chapter also provides information on system board jumper settings.

- Chapter 4, "Installing the Operating System" describes how to install the operating system.

- Chapter 5. "Maintenance" provides you with all the information necessary to maintain successful operation of the server. This chapter also includes a description on relocating and storing the server.

- Chapter 6, "Troubleshooting" contains helpful information for solving problems that might occur with your system.

- Chapter 7, "Upgrading Your System" provides you with instructions for upgrading your system with an additional processor, optional memory, options cards, and peripheral devices.

- Appendix A, "Technical Specifications" provides specifications for your server system.

- Appendix B, "Interrupt Request/PCI IRQ Device/I/O Port Address Assignments" provides the Interrupt Requests (IRQs), PCI IRQ device, and I/O port addresses that are assigned by the factory for this system. These values can be used for reference when installing an optional device.

- Appendix C, "Installing Windows 2000/Windows NT 4.0" describes how to install Microsoft Windows 2000 and Microsoft Windows NT 4.0 without using Express Setup.

- Appendix D, "Equipment Log" provides a table for documenting your system configuration and future updates you may make to your system.

- "Glossary" defines the standard acronyms and technical terms used in this manual.

Text Conventions

This guide uses the following text conventions.

IMPORTANT:	Items that are mandatory or require attention when using the server
NOTE:	Notes give important information about the material being described.

Safety Indications and Symbols

Safety

Follow the instructions in this User's Guide to use your server safely.

In this User's Guide a "WARNING" or "CAUTION" is used to indicate a degree of danger. These terms are defined as follows:

⚠ **WARNING**	Warnings alert you to situations that could result in serious personal injury or loss of life.
⚠ **CAUTION**	Indicates the presence of a hazard that may cause minor personal injury, including burns, or property damage if the instruction is ignored.

Symbols

Precautions and notices against hazards are represented with one of the following three symbols:

⚠	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type. (Attention)
🚫	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action. (Prohibited Action)
●	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard. (Mandatory Action)

Attentions

⚡	Indicates that improper use may cause an electric shock.
♨	Indicates that improper use may cause personal injury.
🖐	Indicates that improper use may cause fingers to be caught.
🔥	Indicates that improper use may cause fumes or fire.
⚠	Indicates a general notice or warning that cannot be specifically identified.
☀	Indicates that improper use may cause loss of eyesight due to laser beam.

Prohibited Actions

	Indicates a general prohibited action that cannot be specifically identified.
	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.

Mandatory Action

	Unplug the power cord of the server. Otherwise, an electric shock or fire may be caused.
	Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.

Related Documents

In addition to this guide, the following system documentation is included with your server either as electronic files on EXPRESSBUILDER or as paper copy shipped with your server.

■ *System Release Notes*
Release Notes provide you with the latest information about your system. This information was not available to be included in your user's guide at the time it was developed and released.

■ *Getting Started Sheet*
The Getting Started Sheet provides several easy-to-follow steps to become familiar with your server documentation and to complete your installation successfully.

Safety Notices

■ **Caution:** To reduce the risk of electric shock which could cause personal injury, follow all safety notices. The symbols shown are used in your documentation and on your equipment to indicate safety hazards.

■ **Warning:** Lithium batteries can be dangerous. Improper handling of lithium batteries may result in an explosion. Dispose of lithium batteries as required by local ordinance or as normal waste if no local ordinance exists.

■ **Warning:** The detachable power supply cord is intended to serve as the disconnect device.

■ **Warning:** This equipment has a 3-wire, grounded power cord. To prevent electrical hazards, do not remove or defeat the ground prong on the power cord. Replace the power cord if it gets damaged. Contact your dealer for an exact replacement.

■ **Warning:** The DC push-button on/off switch on the front panel does not turn off the system AC power. Also, +5vdc is present on the system board whenever the AC power cord is connected between the system and an AC outlet. Before doing the procedures in this manual, make sure that your system is powered off and unplug the AC power cord from the back of the chassis. Failure to disconnect power before opening your system can result in personal injury and equipment damage.

In the U.S.A. and Canada, the power cord must be a UL-listed detachable power cord (in Canada, CSA-certified), type ST or SJT, 16 AWG, 3-conductor, provided with a molded-on NEMA type 5-15 P plug cap at one end and a molded-on cord connector body at the other end. The cord length must not exceed 9 feet (2.7 meters).

Outside the U.S.A. and Canada, the plug must be rated for 250 VAC, 10 amp minimum, and must display an international agency approval marking. The cord must be suitable for use in the end-user country. Consult your dealer or the local electrical authorities if you are unsure of the type of power cord to use in your country. The voltage change occurs via a switch in the power supply.

■ **Warning:** Under no circumstances should the user attempt to disassemble the power supply. The power supply has no user-replaceable parts. Inside the power supply are hazardous voltages that can cause serious personal injury. A defective power supply must be returned to your dealer.

Safety Notices for Users Outside of the U.S.A. and Canada

■ **PELV (Protected Extra-Low Voltage) Integrity:** To ensure the extra-low voltage integrity of the equipment, connect only equipment with mains-protected electrically-compatible circuits to the external ports.

■ **Remote Earths:** To prevent electrical shock, connect all local (individual office) computers and computer support equipment to the same electrical circuit of the building wiring. If you are unsure, check the building wiring to avoid remote earth conditions.

■ **Earth Bonding:** For safe operation, only connect the equipment to a building supply that is in accordance with current wiring regulations in your country. In the U.K., those regulations are the IEE.

Care and Handling

Use the following guidelines to properly handle and care for your system.

Protect the system from extremely low or high temperatures. Let the system warm (or cool) to room temperature before using it.

Keep the system away from magnetic forces.

Keep the system dry. Do not wash the system with a wet cloth or pour fluid into it.
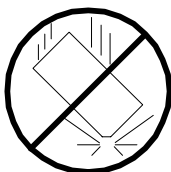
Protect the system from being bumped or dropped.

Check the system for condensation. If condensation exists, allow it to evaporate before powering on the system.

Keep the system away from dust, sand, and dirt.

Chapter 1

System Overview

This chapter provides information that you should familiarize yourself with before using the server. It includes names and functions of the components and features of the server.

OVERVIEW

Your server is a modular multiprocessing server based on the Intel® Pentium® III microprocessors. It is a solid performer and offers the latest technology. The combination of compute performance, memory capacity, and integrated I/O provides a high performance environment for many server market applications. These range from large corporations supporting remote offices to small companies looking to obtain basic connectivity capability such as file and print services, e-mail, web access, web site server, etc.

Your server is a rack-mount system that conveniently installs into a standard EIA 19-inch rack assembly.
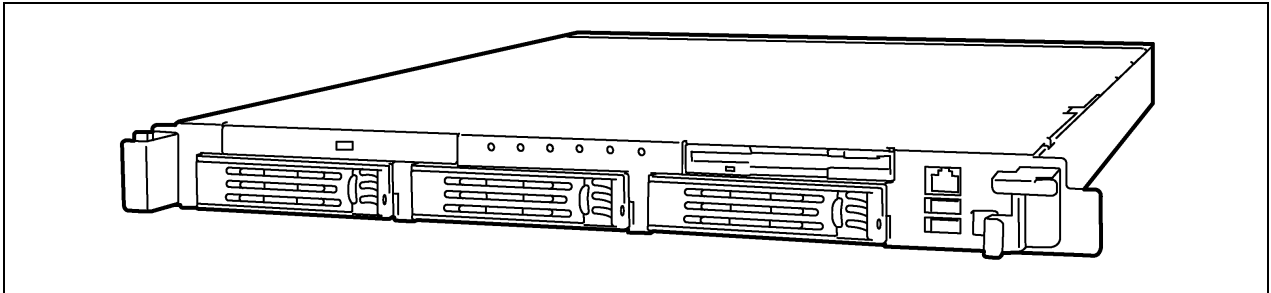
Your server includes a 3.5-inch diskette drive, a CD-ROM drive and three hot-swap SCSI hard disk drive bays. The hot-swap SCSI hard disk drive bays support up to three 1.0-inch SCSI hard disk drives that can be swapped in or out of the system without powering it down, if RAID functionality is configured in the system.

As application requirements increase, you can expand your server with an additional processor, additional memory, add-in boards, and hard disk drives.

Front View with Front Bezel Closed

The following figure shows the location of the front system features.
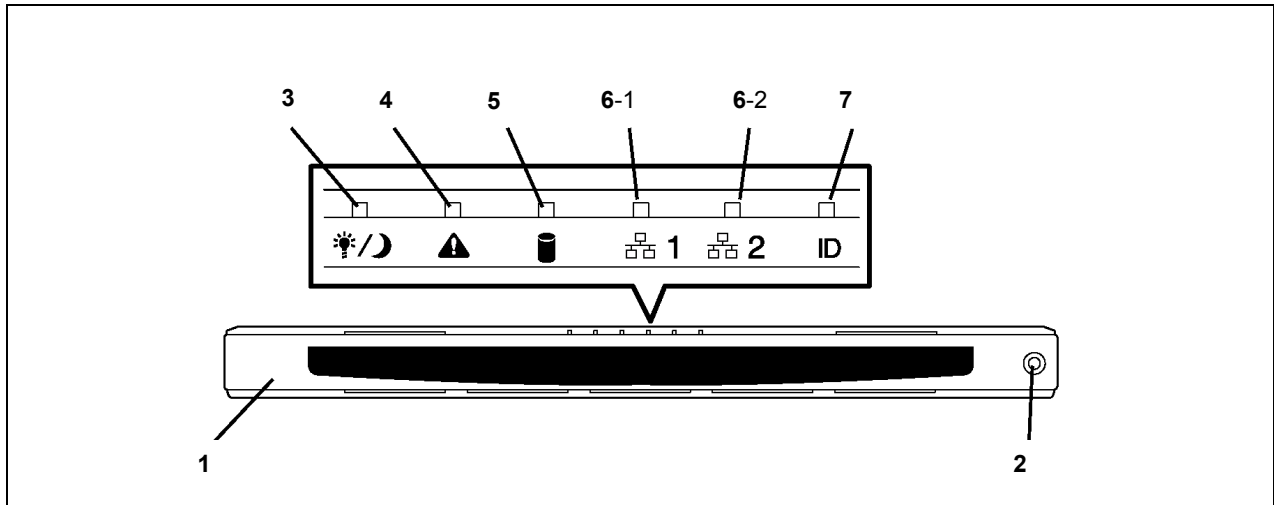
1   Front bezel
   The front bezel is a cover protecting and providing security for the front controls and devices
   in the server. A security key is provided to lock the cover.
2   Keylock
   Insert the security key into the key slot of the keylock when unlocking the front bezel.
3   POWER/SLEEP lamp (green)
   This lamp turns green when the power is turned on.
4   STATUS lamp (green/amber)
   This lamp indicates the server status. The lamp is green during normal operation. The lamp
   turns amber color or flashes when the server enters an abnormal state.
5   DISK ACCESS lamp (green/amber)
   This lamp is green during access to the internal hard disks. The lamp turns amber color
   when one of the internal hard disks fails.
6   ACT lamp (green)
   This lamp is on while the system is connected to the network. Icon number "1" indicates LAN
   port 1, and Icon number "2" indicates LAN port 2.
7   UID lamp (blue)
   This lamp goes on when the UID switch is pressed or when software issues a command.

Front View with Front Bezel Removed
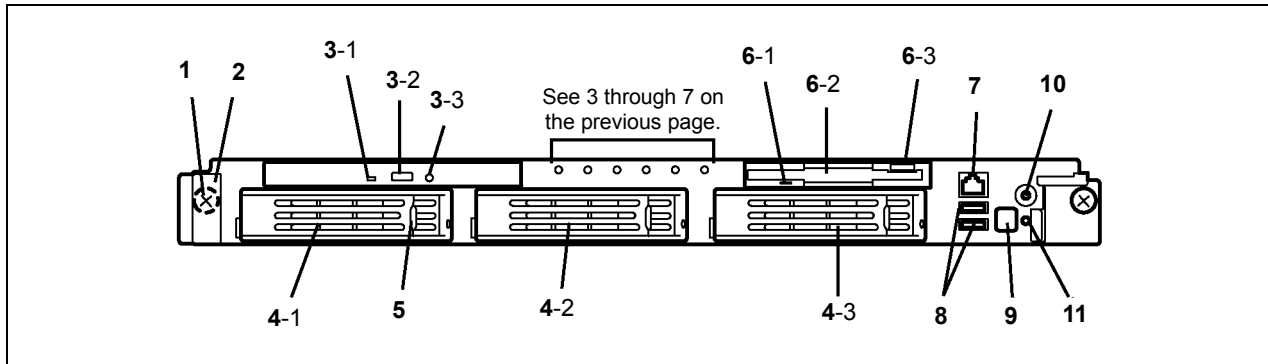
1   Thumbscrews (one on each side of the front panel)
The thumbscrews secure the server to the rack.

2   Handles (one on each side of the front panel)
The handles are used to grasp the server unit when sliding it in and out of the rack.

3   CD-ROM drive
3-1 Disk access lamp
3-2 CD tray eject button
3-3 Emergency hole

4   Hard disk bays
Each number following the bold-faced number indicates the SCSI ID. Dummy trays are
mounted in the bays, except **4**-1 in the standard system configuration.

5   DISK lamp (green/amber)
Each hard disk lamp is green when the drive is being accessed. The lamp turns amber color
when the hard disk fails. The lamp flashes between green and amber during the build
process (in disk array configuration only).

6   3.5-inch floppy disk drive
6-1 Disk access lamp
6-2 Disk slot
6-3 Eject button

7   Front serial port 2 connector
Connect a serial interface device to this connector. The server jumper setting needs to be
changed depending on the device to be connected. This connector is capped to prevent
accidentally connecting a RJ-45 network cable connector to this serial port connector.

8   USB connectors (2 ports)
Connect only USB compliant devices to these connectors. (Windows NT 4.0 requires a
compliant driver.)

9   POWER switch
Press this switch to turn the power on/off. Pressing the switch once turns the power on, and
the POWER/SLEEP lamp goes on. Pressing it again turns the power off. Pressing the
switch for 4 seconds or more turns the power off automatically.

10   UID (unit ID) switch
Press this switch to turn the UID lamps on/off. There is a UID lamp located on the front and
rear panels of the server.

11   DUMP switch
Press this switch to dump memory.

Rear View
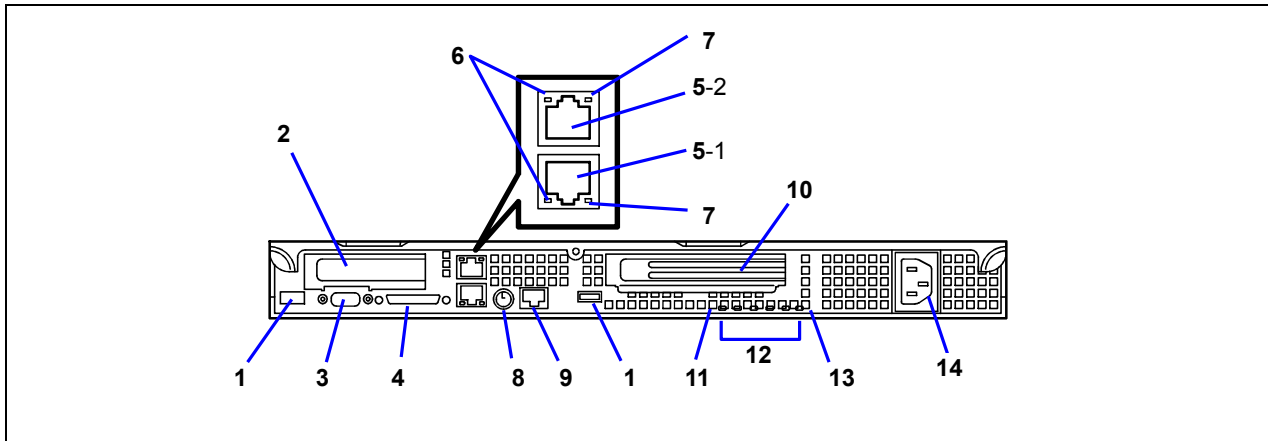
1   USB connector

Connect a device compliant USB interface to this connector. (Windows NT 4.0 requires a compliant driver.)

2   Low-profile PCI board extension slot

Mount a low-profile PCI board into this slot. The slot number is 1C.

3   Monitor connector

Connect a monitor display unit to this connector.

4   SCSI connector

Connect an external SCSI device to this connector.

5   100BASE-TX/10BASE-T connectors

Connect LAN network systems to these connectors.

The number "1" following bold-faced number 5 indicates LAN port 1, and the number "2" indicates LAN port 2.

To remove a connector in LAN port 1 use a flat-tip screwdriver to push the locking tab on the connector. Use care not to damage the LAN port or any other ports with screwdriver.

6   LINK/ACT lamp (green)

This lamp indicates access status of the LAN.

7   Speed lamp (amber)

This lamp indicates the transmission speed of the LAN.

8   Mouse/keyboard connector

Connect the mouse and keyboard to the connector using the PS2 "Y" cable.

9   Rear serial port 2 connector

Connect a serial interface device to this connector. The server setting needs to be changed depending on the device to be connected. This connector is capped to prevent accidentally connecting a RJ-45 network cable connector to this serial port connector.

10   Full-height PCI board extension slots

Mount a full-height PCI board in this slot. The slot number is 1B.

11   STATUS lamp (green/amber) (on the real panel)
This lamp indicates the server status. The lamp is green color during normal operation. The lamp turns amber color or flashes when the server enters an abnormal state.

12   POST lamps
The POST lamps are when POST is running and checking the system.

13   UID lamp (blue)
This lamp goes on when the UID switch is pressed or when a software command is issued.

14   AC inlet
Connect the power cord to this socket.

> **IMPORTANT:** The "100BASE-TX/10BASE-T connector" (Feature 5 above) and the "serial port 2 connector" (Feature 9 above) are the same size and shape. Be careful when connecting a cable to either one of these connectors in order to prevent accidentally connecting a RJ-45 network cable connector to a serial port connector or vice versa.

Internal View

8-1 to **8**-5 (right to left)
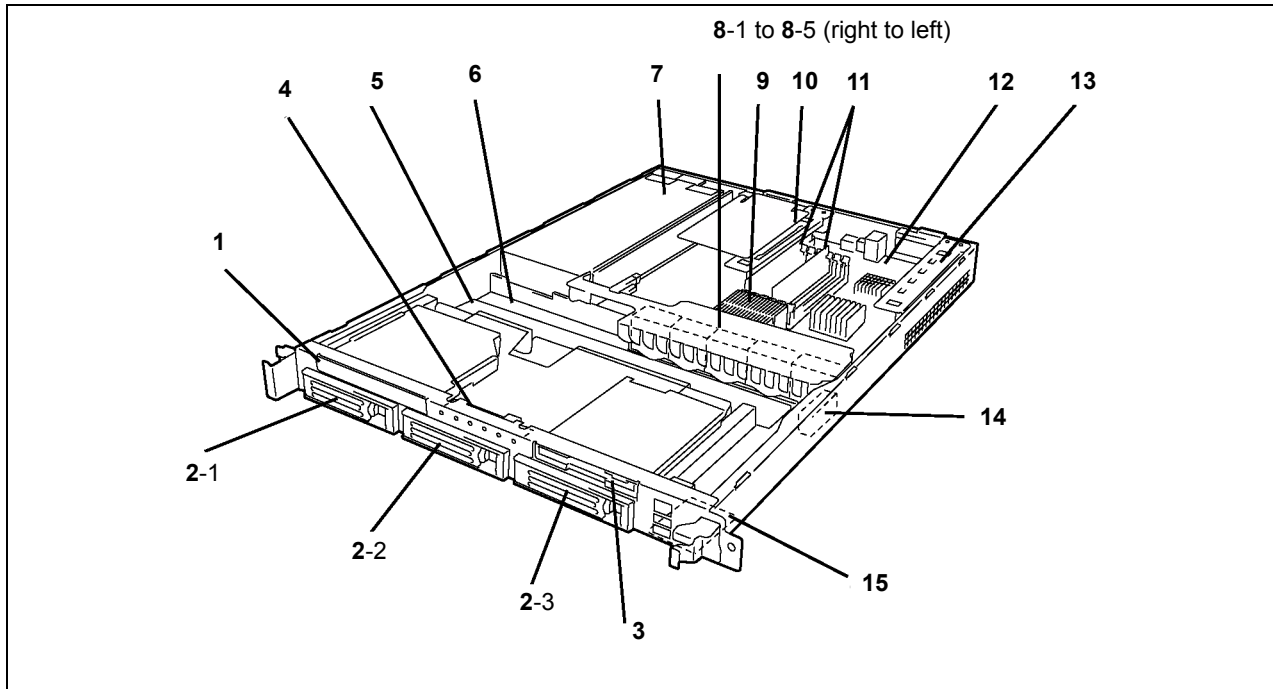
1 **CD-ROM drive**

2 **Disk bays**
   (Each number following the bold-faced number indicates the placement order of the disk drives.)

3 **Floppy disk drive**

4 **Front LED board**

5 **SCSI backplane**

6 **Power jumper board**

7 **Power supply unit**

8 **Cooling fans**
   (Each number following the bold-faced number indicates the corresponding fan name.)
   8-1 System FAN 3
   8-2 CPU 2 FAN
   8-3 System FAN 2
   8-4 CPU 1 FAN
   8-5 System FAN 1

9 **Processor (mounted under the CPU and heat sink)**

10 **Riser card (full-height boards)**

11 **DIMM (Two standard DIMMs are mounted in slots #1A and #1B.)**

12 **System board**

13 **Riser card (low-profile boards only)**

14 **Cover open sensor**

15 **Front panel board**

System Board
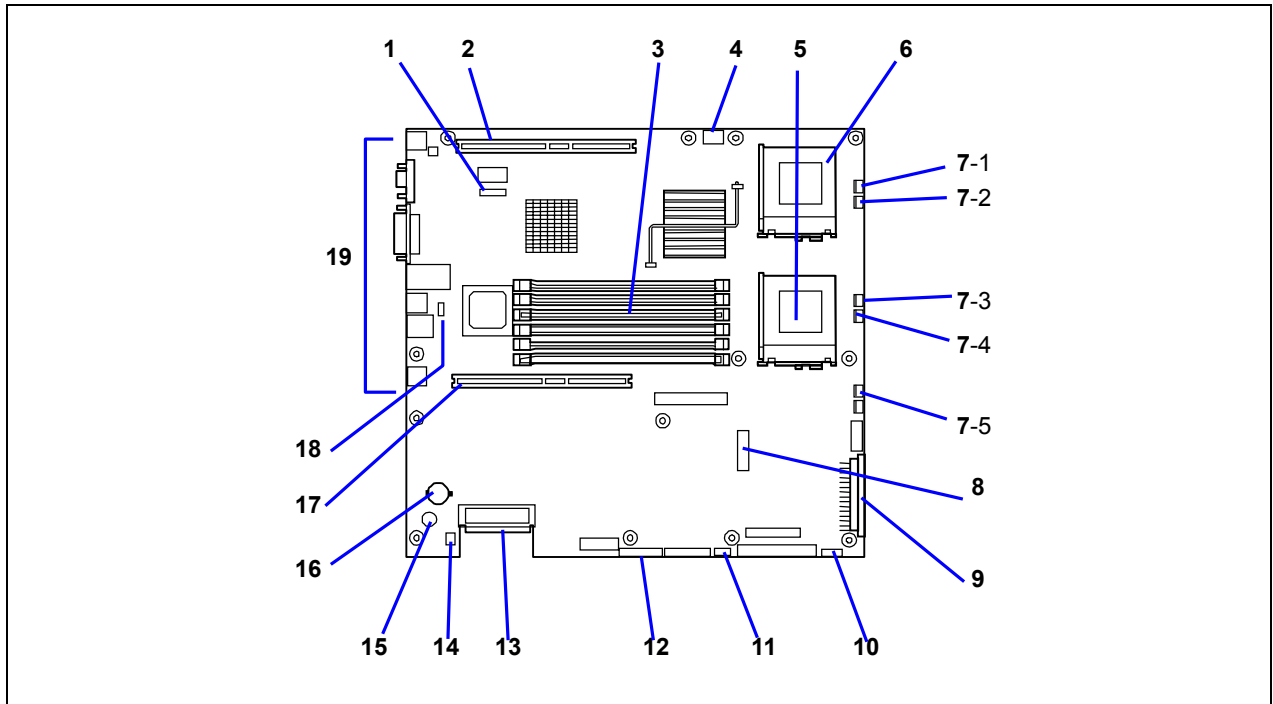
1 **ICMB connector**
2 **PCI riser card connector**
   (Low-profile boards only. 66 MHz/64-bit)
3 **DIMM sockets (for interleave memory)**
   (Starting from the top of the sockets that are shown above, the sockets are sequentially
   numbered #3B, #2B, #1B, #3A, #2A, and #1A.)
4 **USB connector(front panel)**
5 **Processor #1 (CPU#1) socket**
6 **Processor #2 (CPU#2) socket**
7 **Cooling fan connectors**
   7-1 System FAN 3
   7-2 CPU 2 FAN
   7-3 System FAN 2
   7-4 CPU 1 FAN
   7-5 System FAN 1
8 **Peripheral interface connector**
9 **Main power connector**
10 **Power signal connector**
11 **SCSI IPMB connector**
12 **Configuration jumper switch**
13 **Internal SCSI connector** (for internal hard disk drives)
14 **SCSI/disk array controller access lamp connector**
   (For optional SCSI/disk array controller.)
15 **Speaker**
16 **Lithium battery**
17 **PCI riser card connector**
   (Full-height boards. 66 MHz/64-bit)
18 **Jumper pin for selecting a serial port DCD/DSR pin-out (J6A2 jumper block)**
19 **Connectors for external device**

STATUS INDICATORS

This section describes the server status indicators.

POWER Lamp ( )

The POWER lamp is lit (green) while the server power is on. It is off when no power is being supplied to the server.

> **NOTE:** This server does not support power saving mode.

STATUS Lamp ( )

The STATUS lamp is lit (green) while the server is operating normally. (There is a STATUS lamp located on both the front and rear panels of the server.) If the STATUS lamp is off or turns amber color and flashes, it indicates that the server is in an abnormal state.

The table below lists and describes the STATUS lamp indications and any actions to be taken.

> **NOTES:**
>
> - If ESMPRO or the offline maintenance utility is installed, you can determine the cause of a failure by referring to the error log.
>
> - The system can be restarted automatically. However, if the automatic restart cannot be performed for any reason, then the system must be shutdown manually by turning the power off and back on.

STATUS lamp indication	Description	Action
On (green)	The server is operating normally.	–
Flashing (green)	• The server is operating with the memory or CPU in degraded state. • A 1-bit memory error occurs frequently.	Identify the device in degraded state by using the BIOS setup utility "SETUP," and replace it as soon as possible.
Off	Power is off.	–
	POST is in progress.	Wait while POST is checking the system. The STATUS lamp turns green when POST is completed.
	CPU error occurred.	Turn the power off and on. If the POST screen displays an error message, record the message, and contact your service representative.
	CPU temperature alarm was detected. (Thermal-Trip)	
	A timeout occurred when the time set for the watchdog timer was reached.	
	An uncorrectable memory error was detected.	
	PCI system error occurred.	
	PCI parity error occurred.	
	CPU bus error occurred.	
	A memory dump request was issued.	Wait until the memory dump is completed.
On (amber)	A temperature alarm was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the STATUS lamp indication does not change when the fans are operating correctly, contact your service representative.
	A voltage alarm was detected.	Contact your service representative.
	All the power supply units failed.	
Flashing (amber)	A fan alarm was detected.	Check if the fan units are firmly connected. If the STATUS lamp indication does not change when the fans are operating correctly, contact your service representative.
	A temperature warning was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the STATUS lamp indication does not change when the fans are operating correctly, contact your service representative.

DISK ACCESS Lamp (⬛)

The DISK ACCESS lamp indicates the status of the hard disk mounted in the 3.5-inch device bay.

The lamp turns green each time access is made to the hard disk.

When the DISK ACCESS lamp turns amber color, it indicates that a hard disk failure has occurred. Check the hard disk lamp for the status of the failing hard disk.

When the DISK ACCESS lamp flashes between green and amber or if the lamp turns amber and flashes, it indicates that rebuild (reconstruction) processing is being performed for a hard disk connected to the internal disk array controller.

> **IMPORTANT:** If a hard disk in the server is connected to the internal disk array controller, the access lamp signal cable (provided with the server) must be connected from the disk array controller to the system board.

ACT Lamp (🖧)

The ACT lamp is a green color while the server is connected to the LAN. The lamp flashes while the server is accessed via the LAN (during transmission/reception of packets). The number next to the icon indicates the network port number on the rear panel of the server.

Disk Access Lamp

The disk access lamp on the floppy disk drive or CD-ROM drive is lit while the drive is accessed.

Hard Disk Lamp

The disk lamp mounted in the 3.5-inch device bay indicates the following status:
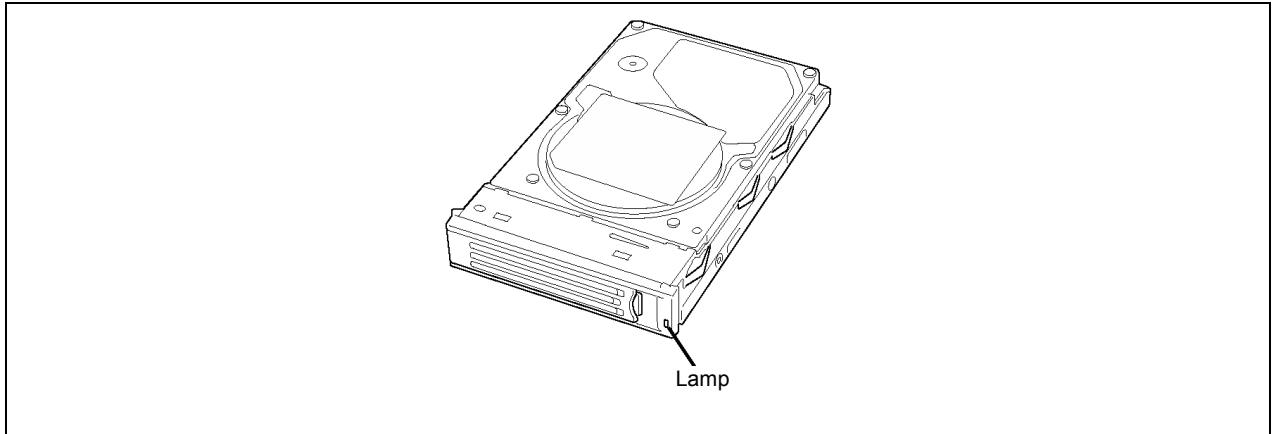
Lamp

- Flashing (green)

  Lamp indicates that the hard disk is being accessed.

- Lit (amber)

  Lamp indicates a failure of a hard disk mounted in a disk array configuration.

  > **NOTE:** Even if one of the hard disks fails in disk array configuration
  > (RAID1, RAID5, or RAID0+1), the server can continue operation.
  > However, the disk must be replaced as soon as possible, and
  > reconstruction (rebuild) processing must be performed. (The failing disk
  > can be replaced in hot swap mode.)

- Flashing between green and amber

  The lamp indicates that reconstruction (rebuild) processing is being performed for the
  hard disk. (This flashing does not indicate a failure.) When a failing hard disk is
  replaced in disk array configuration, the system automatically rebuilds the data. (Auto-
  rebuild function) The lamp switches back and forth between green and amber during
  rebuild processing.

  The lamp goes off when the rebuild processing has terminated. It turns amber color
  when the rebuild processing fails.

> **IMPORTANT:** If the server is turned off during rebuild processing, the processing is stopped. Restart the server, mount the new hard disk in hot swap mode, and then perform rebuild processing again. When using the auto-rebuild function observe the following:
>
> ■ Do not turn the power off. (Once the power is turned off, the auto-build function does not start.)
>
> ■ Let 90 seconds or more pass between when dismounting a failing hard disk and when mounting the new one.
>
> ■ Do not replace a failing hard disk while rebuild processing is being performed for another hard disk.

LAN Connector Lamps

There are two lamps for each of the two LAN ports (connectors) on the rear panel.
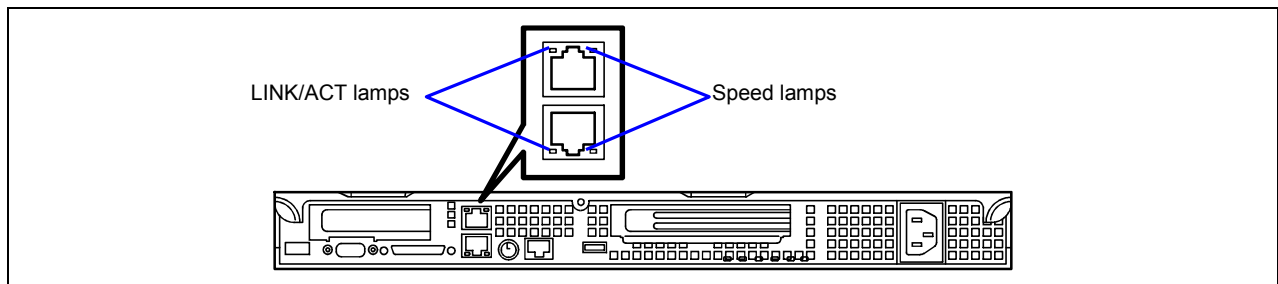
■ LINK/ACT lamps

Each LINK/ACT lamp indicates the status of its network port. While power is supplied to the server and HUB and the connection is correct (LINK), the lamp is lit (green). The lamp turns green and flashes while the network port is transmitting/receiving data (ACT).

If the lamp does not light in the LINK state, check if the network cable is connected correctly. If the lamp still does not light when everything looks normal, the network (LAN) controller may be faulty. In this case, contact your service representative.

■ Speed lamps

Each Speed lamp indicates that the communication mode of the standard network port of the server is activated with the network interface of 100BASE-TX or 10BASE-T. When the lamp is lit (amber), it indicates that the communication mode is activated with 100BASE-TX. When it is off, it indicates that the communication mode is activated with 10BASE-T.

STANDARD FEATURES

High performance

- Intel® Pentium® III Processor (1GHz/1.26GHz-S)
- High-speed 100BASE-TX/10BASE-T interface (100Mbps/10Mbps supported)
- High-speed disk access (Ultra160 SCSI x 2)
- High-speed memory access (133MHz, ECC, registered, PC/133 compliant, 72-bit, 68-pin, 3.3V)

Expandability

- Two PCI add-in card slots (full-length, full-height 64-bit/66-MHz and low-profile 64-bit/66-MHz)
- Up to 6 GB of memory
- Three hot-swap SCSI hard disk drive bays
- Up to two multi-processors are available for upgrade.
- USB interface (USB-support driver is required.)
- Two network ports
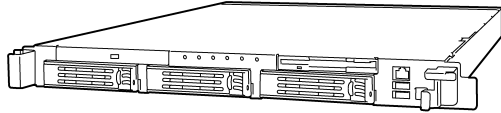
High-reliability

- Memory monitoring feature (1-bit error correction/ 2-bit error detection)
- CPU/memory degradation feature (logical isolation of a failed device)
- Bus parity error detection
- Temperature detection
- Error notification
- Internal fan monitoring feature
- Internal voltage monitoring feature
- Auto-rebuild feature (optional, hot-swappable)
- BIOS password feature
- Mechanical security lock

Many Available Features

- Graphic accelerator "RAGE XL" support
- El Torito Bootable CD-ROM (no emulation mode) format support
- POWER switch mask
- Software power-off
- Remote power-on feature
- AC-LINK feature
- Baseboard Management Controller (BMC)
- Consoleless feature

Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis (T&D)

Management Utilities

- ESMPRO
- Management Workstation Application (MWA)

Maintenance Features

- Off-line Maintenance Utility
- Memory dump feature using the DUMP switch

Easy and Fine Setup

- EXPRESSBUILDER (system setup utility)
- Configuration Parameter Diskette Creator
- SETUP (BIOS setup utility)
- SCSI*Select* (SCSI device utility)

Power Supply

The power supply is rated for 250 watts of power.

The power subsystem supports the remote management features, including remote enable that permits power to be activated from a variety of sources.

Peripheral Bays

Your server supports a variety of standard PC AT-compatible peripheral devices. The chassis includes the following peripheral bays:

- A 3.5-inch front panel bay for mounting the standard 3.5-inch diskette drive (supports 720 KB and 1.44 MB diskette media)
- A standard CD-ROM drive bay
- Three hot-swap SCSI hard disk drive bays for mounting hard disk drives installed in easily removable drive carriers.

   NOTE: The hot-swap SCSI hard disk drive bays contain a hot-swap back plane that require an 80-pin single connector attachment (SCA) connector on the drives that you install.

System Cooling

The chassis includes a non-hot-swappable fan module with five fans for cooling the processor(s), hard drives, and PCI cards. The fan system is located in the middle of the chassis to pull cooling air through the chassis. The power supply contains two built-in fans for cooling.

SAF-TE LOGIC

> **NOTE:** SAF-TE Logic is in systems that include the hot-swap SCSI disk drive cage. SAF-TE Logic is not available in systems that include the standard SCSI disk drive cage.

The SCSI backplane includes SAF-TE (SCSI Accessed Fault Tolerant Enclosure) logic that provides an interface to the disk subsystem that supports status signals, hot swapping drives, and enclosure monitoring.

The transport mechanism for the standardized alert detection and status reporting is the SCSI bus. Disk drives, power supplies, cooling fans, and temperature are continually monitored and the conditions then reported over the SCSI bus to the system. When used with RAID management software the user can be alerted of impending or imminent disk conditions requiring attention. This allows the user to react to conditions that could normally go unnoticed until data loss.

SYSTEM BOARD FEATURES

The following subsections describe the major components of the system board. See "System Board" earlier in this chapter.

Processor

The system board accommodates one or two Intel Pentium III processors with 512k cache in the FC-PGA2 package. This processor uses the .13 micron technology and offers advanced performance. The processor external interface operates at a maximum of 133 MHz.

Memory

The system board contains six 168-pin DIMM sockets each supporting 72-bit ECC (64-bit main memory plus ECC) registered SDRAM DIMMs (PC-133 compatible). Memory is two-way interleaved and partitioned in three banks. You may install a minimum of 256 MB (128MB × 2) and as much as 6 GB.

The controller automatically detects, sizes, and initializes the memory array, depending on the type, size, and speed of the installed DIMMs and reports memory size and allocation to the server via configuration registers.

> **NOTE:** Use DIMMs that have been tested for compatibility with the server board.
> Contact your service representative or dealer for a current list of approved memory modules.

PCI Riser Slots

The server board has two PCI riser slots, each capable of supporting 64-bit/66-MHz PCI riser cards.

PCI features:

- Bus speed up to 66 MHz
- 32 bit memory addressing
- 5 V/3.3 V signaling environment
- Burst transfers of up to 512 Mbps
- 8, 16, 32, or 64-bit data transfers
- Plug and Play ready
- Parity enabled

Video

The system board uses an ATI RAGE XL PCI graphics accelerator with 8 MB of video SDRAM that supports all standard IBM VGA modes. The embedded SVGA video subsystem supports:

- Pixel resolutions up to 1600 x 1200 under 2D and 1024 x 768 under 3D
- CRT and LCD monitors up to 100 Hz vertical refresh rate

The server board supports disabling of the onboard video through the BIOS setup menu or when a plug in video card is installed in any of the PCI slots.

SCSI Controller

The SCSI version of the server board includes an embedded Adaptec AIC-7899W controller providing dual Ultra160 Low Voltage Differential (LVD) SCSI channels.

The SCSI bus is terminated on the server board with active terminators that cannot be disabled. The onboard device must always be at one end of the bus. The device at the other end of the cable must also be terminated. LVD devices generally do not have termination built-in and need to have a termination source provided. Non-LVDs devices generally are terminated through a jumper or resistor pack on the device itself.

Network Controller

> **NOTE:** To ensure EMC product regulation compliance, the system must be used with a shielded LAN cable.

The server board uses two Intel ® 82550PM Fast Ethernet Controllers and supports two 10Base-T/100Base-TX network subsystems.

The 82550 PM controller supports the following features:

- 32-bit PCI, CardBus master interface
- Integrated IEEE 802.3 10Base-T and 100Base-TX compatible PHY
- IEEE 820.3u auto-negotiation support
- Chained memory structure similar to the 82559, 82558, 82557 and 82596
- Full duplex support at both 10 Mbps and 100 Mbps operation
- Low power +3.3 V device
- IP checksum off-loading

On the system board, NIC 1 can be used as both a network interface and server management interface.

NIC Connector and Status LEDs

The 82550 controller drives LEDs on the network interface connector that indicate link/activity on the LAN and 10- or 100-Mbps operation. The green LED indicates network connection when lit and TX/RX activity when blinking. The yellow LED indicates 100-Mbps operation when lit.

Network Teaming Features

> **NOTE:** Using both on-board NICs in a team does not allow the use of NIC 1 for server management access. To support both network teaming features and server management features, a third NIC must be added and teamed to NIC 2.

The network controller provides several options for increasing throughput and fault tolerance when running Windows NT 4.0, Windows 2000 , NetWare 4.2 or newer:

- Adapter Fault Tolerance (AFT) - provides automatic redundancy for your adapter. If the primary adapter fails, the secondary takes over. AFT works with any hub or switch.

- Adaptive Load Balancing (ALB) - creates a team of two to eight adapters to increase transmission throughput. Also, includes AFT. Works with any 10Base-TX or 100Base-TX switch.

- Fast EtherChannel (FEC) or Intel ® Link Aggregation - creates a team of up to 8 adapters to increase transmission and reception throughput. Also includes AFT. Requires an FEC-enabled switch.

To set up an option, read the instructions in the Windows NT 4.0 or NetWare readme files.

General Configuration Notes

1. Windows NT versions prior to 4.0 do not support Adapter Teaming options.

2. Adapter Teaming options require NT 4.0 with Service Pack 4.0 or higher.

3. In Windows NT, teaming options cannot be implemented on adapters that have been configured for VLANs. NetWare can support teaming options and VLANs on the same adapters.

Adapter Fault Tolerance

Adapter Fault Tolerance (AFT) is a simple, effective, and fail-safe approach to increase the reliability of server connections. AFT gives you the ability to set up link recovery to the server adapter in case of a cable, port, or network interface card failure. By assigning two server adapters as a team, AFT enables you to maintain uninterrupted network performance.

AFT is implemented with two server adapters: a primary adapter and a backup, or secondary, adapter. During normal operation, the backup will have transmit disabled. If the link to the primary adapter fails, the link to the backup adapter automatically takes over.

Preferred Primary Adapter

With multiple adapters installed, you can specify one as the Preferred Primary adapter. For example if you have a server with a PRO/1000 server adapter as the primary adapter and a PRO/100+ adapter as the secondary, you could configure the PRO/1000 server adapter to be the preferred primary. In this scenario, if the PRO/1000 server adapter fails, the PRO/100+ will take over. Then when the PRO/1000 server adapter is replaced, it will automatically revert to being the primary adapter in the team.

If a Preferred Primary is not selected, PROSet will attempt to select the best adapter, based on adapter model and speed.

Mixed Adapter Teaming

AFT supports up to eight server adapters per team, in any mix.

Adaptive Load Balancing

Adaptive Load Balancing (ALB) is a simple and efficient way to increase your server's transmit throughput. With ALB you group server adapters in teams to provide an increased transmit rate (up to 8 Gbps) using a maximum of eight adapters. The ALB software continuously analyzes transmit loading on each adapter and balances the rate across the adapters as needed. Adapter teams configured for ALB also provide the benefits of AFT. Receive rates remain at 100 Mbps or 1 Gbps depending on the primary adapter's capability.

To use ALB, you must have two to eight server adapters installed in your server or workstation and linked to the same network switch.

Keyboard and Mouse

The keyboard and mouse controller is PS/2-compatible. The server may be locked automatically if there is no keyboard or mouse activity for a predefined length of time. Once the inactivity (lockout) timer has expired, the keyboard and mouse do not respond until the previously stored password is entered. The Y-cable (shipped with your system) can be used if both a PS/2 mouse and keyboard are required at the same time. The keyboard and mouse are ordered separately.

RJ-45 Serial Port

The rear RJ-45 serial port is a fully functional COM port that supports any standard serial device and provides support for serial concentrators, which typically support RJ45 serial connectors. For server applications that use a serial concentrator to access the server management features of the baseboard, a standard 8-pin CAT-5 cable from the serial concentrator is plugged directly into the rear RJ45 serial port. The 8 pins of the RJ45 connector can be configured to match either of two pin-out standards used by serial port concentrators. To accommodate either standard, the J6A2 jumper block located directly behind the rear RJ45 serial port must be jumpered appropriately according to which standard is desired.

See Chapter 3 for detail explanation.

ACPI

The system board supports the Advanced Configuration and Power Interface (ACPI) as defined by the ACPI 1.0 and PC97 specifications. An ACPI aware operating system can put the system into a state where the hard drives spin down, the system fans stop, and all processing is halted. However, the power supply will still be on and the processors will still be dissipating some power, so the power supply fans will still run.

The system board supports sleep states s0, s1, s4, and s5:

- s0: Normal running state.

- s1: Processor sleep state. No context will be lost in this state and the processor caches will maintain coherency.

- s4: Hibernate or Save to Disk: The memory and machine state are saved to disk. Pressing the power button or other wakeup event will restore the system state from the disk and resume normal operation. This assumes that no hardware changes have been made to the system while it was off.

- s5: Soft off: Only the RTC section of the CSB and the BMC are running in this state. No context is saved by the OS or hardware.

> **IMPORTANT:** The system is off only when the AC power cord is disconnected.

System Board Management Controller (BMC)

Server management is concentrated in the System Board Management Controller (BMC). The BMC and associated circuitry are powered from a 5Vdc standby voltage, which remains active when system power is switched off, but the ac power source is still on and connected.

The BMC supports the Management Workstation Application (MWA), which allows remote server management via a LAN, a modem, or direct connection to a manager system. Events monitored by the manager system include over-temperature and over-voltage conditions, fan failure, or chassis intrusion.

Information on the MWA may be found in the ESMPRO User's guide on the ESMPRO CD-ROM included with your server.

One major function of the BMC is to autonomously monitor system management events, and log their occurrence in the nonvolatile System Event Log (SEL). The events being monitored include overtemperature and overvoltage conditions, fan failure, or chassis intrusion. To enable accurate monitoring, the BMC maintains the nonvolatile Sensor Data Record (SDR), from which sensor information can be retrieved. The BMC provides an ISA host interface to SDR sensor information, so that software running on the server can poll and retrieve the server's current status.

The BMC performs the following:

- Monitors server board temperature and voltage
- Monitors processor presence and controls Fault Resilient Boot (FRB)
- Detects and indicates baseboard fan failure
- Manages the SEL interface
- Manages the SDR Repository interface
- Monitors the SDR/SEL timestamp clock
- Monitors the system management watchdog timer
- Monitors the periodic SMI timer
- Monitors the event receiver
- Controls secure mode, including video blanking, diskette write-protect monitoring, and front panel lock/unlock initiation
- Controls Wake On LAN via Magic Packet support.

DEGRADATION FEATURE

The degradation feature automatically isolates a failed DIMM or processor to assure continuous operation of the server when the POST (Power On Self-Test, self-diagnosis program after power on) detects such a DIMM or processor.

> **NOTE:** The degradation feature is only available when at least two DIMMs or processors are installed.

Failed DIMMs and processors may be identified on the screen that the POST displays, or with the BIOS setup utility of the server, "SETUP." They may also be identified on the system that has the ESMPRO installed.

REMOTE POWER-ON FEATURE (WAKE ON LAN)

The remote power-on function turns on the server through a network. It sends a special packet from the management computer to a remote server to turn it on if the server is off-powered.

To enable this feature, you must select "Enabled" for "Wake On LAN" in the Wake On Event of the System Hardware menu of the BIOS setup utility, "SETUP." (See Chapter 3.)

The remote power-on feature is not available in the following cases. Press the POWER switch once to start the OS, and turn off the server in an appropriate procedure.

- Abnormal previous system shut-down
- No power supply to the server (due to turned-off breaker, disconnected power cord, power blackout, etc.)

AC-LINK FEATURE

When the power cord of the server is connected to an uninterruptible power supply (UPS) unit, the server supports the power linkage feature that enables control over the power supply from the UPS to the server. The AC-LINK feature can be enabled or disabled with the System Hardware menu of the BIOS setup utility, "SETUP." (See Chapter 3.)

SYSTEM SECURITY

To help prevent unauthorized entry or use of the system, the system includes a full lockable front bezel and Server Management software that monitors the front bezel intrusion switch.

Security with Mechanical Locks and Monitoring

To unlock the bezel, insert the key in the lock and turn the lock counterclockwise until it stops (about a quarter turn). The bezel is now unlocked and can be opened again.

To lock the bezel, insert the key in the lock. Turn the lock clockwise until it stops (about a quarter turn). The bezel is now locked and cannot be opened.

Software Locks via the BIOS Setup Utility

The BIOS Setup Utility provides a number of security features to prevent unauthorized or accidental access to the system. Once the security measures are enabled, you can access the system only after you enter the correct password(s). For example:

- Enable the keyboard lockout timer so that the server requires a password to reactivate the keyboard and mouse after a specified time out period – 1 to 120 minutes.
- Set and enable a supervisor password.
- Set and enable a user password.
- Set secure mode to prevent keyboard or mouse input and to prevent use of the front panel reset and power switches.
- Activate a hot key combination to enter secure mode quickly.
- Disable writing to the diskette drive when secure mode is set.
- Disable access to the boot sector of the operating system hard disk drive.

Using Passwords

You can set either the user password, the supervisor password, or both passwords. If only the user password is set, you:

- Must enter the user password to enter BIOS Setup.

- Must enter the user password to boot the server if Password on Boot is enabled in either the BIOS Setup.

- Must enter the user password to exit secure mode.

If only the supervisor password is set, you:

- Must enter the supervisor password to enter BIOS Setup.

- Must enter the supervisor password to boot the server if Password on Boot is enabled in either the BIOS Setup.

- Must enter the supervisor password to exit secure mode.

If both passwords are set, you:

- May enter the user password to enter BIOS Setup. However, you will not be able to change many of the options.

- Must enter the supervisor password if you want to enter BIOS Setup and have access to all of the options.

- May enter either password to boot the server if Password on Boot is enabled in either the BIOS Setup.

- May enter either password to exit secure mode.

Secure Mode

Configure and enable the secure boot mode by using the BIOS Setup. When secure mode is in effect:

- You can boot the server and the operating system will run, but you must enter the user password to use the keyboard or mouse.

- You cannot turn off system power or reset the server from the front panel switches.

Secure mode has no effect on functions enabled via remote server management or power control via the watchdog timer.

Taking the server out of secure mode does not change the state of system power. That is, if you press and release the power switch while secure mode is in effect, the system will not be powered off when secure mode is later removed. However, if the front panel power switch remains depressed when secure mode is removed, the server will be powered off.

Summary of Software Security Features

The table below lists the software security features and describes what protection each offers. In general, to enable or set the features listed here, you must run the BIOS Setup and go to the Security Subsystem Group, menu. The table also refers to the Setup utility.

Software Security Features

Feature	Description
Secure mode	How to enter secure mode:
	• Setting and enabling passwords automatically places the system in secure mode.
	• If you set a hot-key combination (through Setup), you can secure the system simply by pressing the key combination. This means you do not have to wait for the inactivity time-out period.
	When the system is in secure mode:
	The server can boot and run the operating system, but mouse and keyboard input is not accepted until the user password is entered.
	At boot time, if a CD is detected in the CD-ROM drive or a diskette in drive A, the system prompts for a password. When the password is entered, the server boots from CD or diskette and disables the secure mode.
	If there is no CD in the CD-ROM drive or diskette in drive A, the server boots from drive C and automatically goes into secure mode. All enabled secure mode features go into effect at boot time.
	To leave secure mode: Enter the correct password(s).
Disable writing to diskette	In secure mode, the server will not boot from or write to a diskette unless a password is entered.
	To write protect access to diskette whether the server is in secure mode or not, use the Setup main menu, Floppy Options, and specify Floppy Access as read only.
Set a time out period so that keyboard and mouse input are not accepted. Also, screen can be blanked, and writes to diskette can be inhibited	Specify and enable an inactivity time out period of from 1 to 120 minutes.
	If no keyboard or mouse action occurs for the specified period, attempted keyboard and mouse input will not be accepted.
	The monitor display will go blank, and the diskette drive will be write protected (if these security features are enabled through Setup).
	To resume activity: Enter the correct password(s).
Control access to using the BIOS Setup: set supervisor password	To control access to setting or changing the system configuration, set a supervisor password and enable it through Setup.
	If both the supervisor and user passwords are enabled, either can be used to boot the server or enable the keyboard and/or mouse, but only the supervisor password will allow Setup to be changed.
	To disable a password, change it to a blank entry or press CTRL-D in the Change Password menu of the Supervisor Password Option menu found in the Security Subsystem Group.
	To clear the password if you cannot access Setup, change the Clear Password jumper (see Chapter 3).

Feature	Description
Control access to the system other than BIOS Setup: set user password	To control access to using the system, set a user password and enable it through Setup.
	To disable a password, change it to a blank entry or press CTRL-D in the Change Password menu of the User Password Option menu found in the Security Subsystem Group.
	To clear the password if you cannot access Setup, change the Clear Password jumper (see Chapter 3).
Boot without keyboard	The system can boot with or without a keyboard. During POST, before the system completes the boot sequence, the BIOS automatically detects and tests the keyboard if it is present and displays a message.
Specify the boot sequence	The sequence that you specify in setup will determine the boot order. If secure mode is enabled (a user password is set), then you will be prompted for a password before the server fully boots. If secure mode is enabled and the "Secure Boot Mode" option is also enabled, the server will fully boot but will require a password before accepting any keyboard or mouse input.

EXPRESSBUILDER

The CD-ROM that comes with the server contains a setup utility called "EXPRESSBUILDER."
When you first install the server or append features to the server, use the EXPRESSBUILDER to
set up your server.

Refer to the EXPRESSBUILDER User's Guide on the EXPRESSBUILDER CD for details.

> **IMPORTANT:** The EXPRESSBUILDER is server specific and can only
> be used on the server that it is provided with, otherwise it may cause
> failures.

The major features of the EXPRESSBUILDER are:

- Install the OS.
  It installs an operating system.

- Diagnose the system.
  It diagnoses the server.

- Create a support disk.
  It copies utilities in the EXPRESSBUILDER CD-ROM onto a floppy disk to launch
  them from the floppy disk.

- Update the Windows System*
  It updates several resources of Microsoft Windows 2000 or Windows NT.

- Install utilities
  It installs the management utilities of ESMPRO and MWA.

- Read online documents*
  It opens the online document files (".pdf" files).

  * These functions are available under Windows system.

> **NOTE:** Some of the features listed above can be used from the remote
> computer via cross cable, modem, or LAN (non-console feature).

ESMPRO

ESMPRO is server management software that runs on the OS. ESMPRO includes the ESMPRO Manager for the server monitoring terminal and the ESMPRO Agent for the server.

> **NOTE:** For details of the ESMPRO major functions (i.e., system configuration and setups) see the ESMPRO User's Guide on the ESMPRO CD.
> Available functions of ESMPRO depend on the OS you install. Ask your service representative for details.

OFF-LINE MAINTENANCE UTILITY

The Off-line Maintenance Utility is used for proactive maintenance and fault analysis of the server.

Refer to the EXPRESSBUILDER User's Guide on the EXPRESSBUILDER CD for details.

SYSTEM DIAGNOSTIC UTILITY

The system diagnostic utility contained in the EXPRESSBUILDER is useful to prevent hardware failures.

MANAGEMENT WORKSTATION APPLICATION (MWA)

The Management Workstation Application (MWA) is an application program for remote management of the server from a system management computer (a computer with the ESMPRO Manager running) through a network.

Information on MWA may be found in the ESMPRO User's Guide on the ESMPRO CD.

USING YOUR SERVER

This section describes basic operations of the server, including how to use devices such as the floppy disk drive and the CD-ROM drive.

Front Bezel

Remove the front bezel to power on/off the server, to access the floppy disk drive and CD-ROM drive, and to install/remove hard disks to the 3.5-inch device bays.

> **IMPORTANT:** To open the front door, you must unlock the door with the security key shipped with your system.

Installing or Removing the Front Bezel

When turning the power of the server on/off, accessing to the floppy disk drive or CD-ROM drive, or installing or removing a hard disk on or from the 3.5-inch device bay, first remove the front bezel.

> **IMPORTANT:** Use the security key provided with your server to unlock the front bezel.

1. Insert the security key provided with your server into the key slot and while pressing in on the key turn it counterclockwise to release the lock.
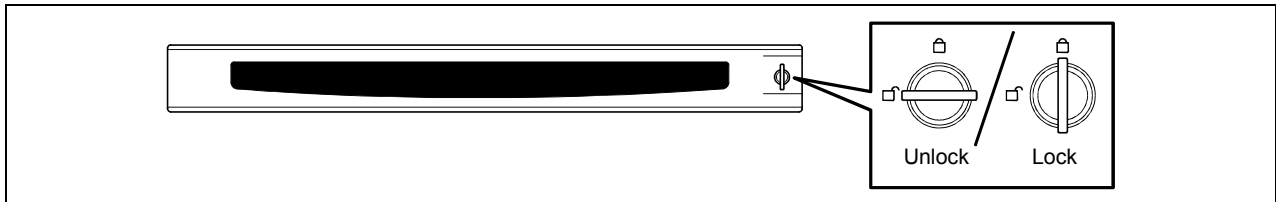
2. Grasp the right end of the front bezel and pull it towards you to open it.

3. Slide the front bezel a little to the left to remove the tab from the frame and then remove the front bezel from the server.
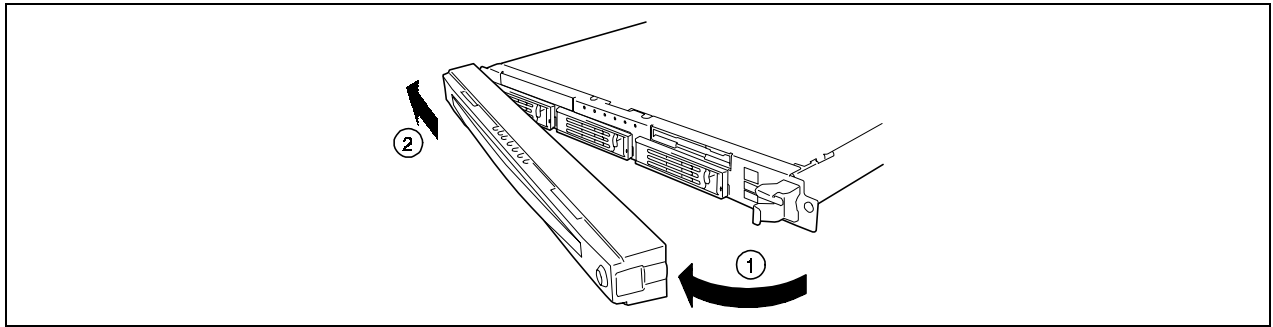
To install the front bezel, latch the tab at the left side of the front bezel on the server frame. After the installation, lock the front bezel by using the security key.
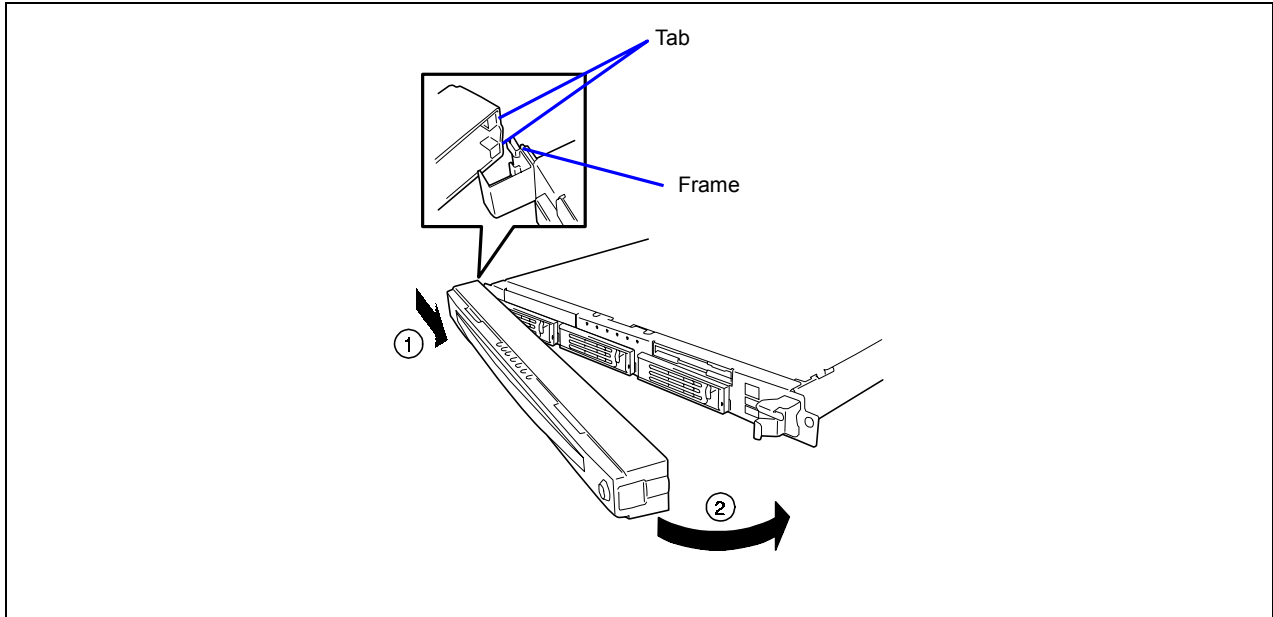
POWER Switch

Use the POWER switch to turn the server on and off.

Power On

Press the POWER switch on the front of the computer chassis.

The POWER/SLEEP lamp lights green in color.
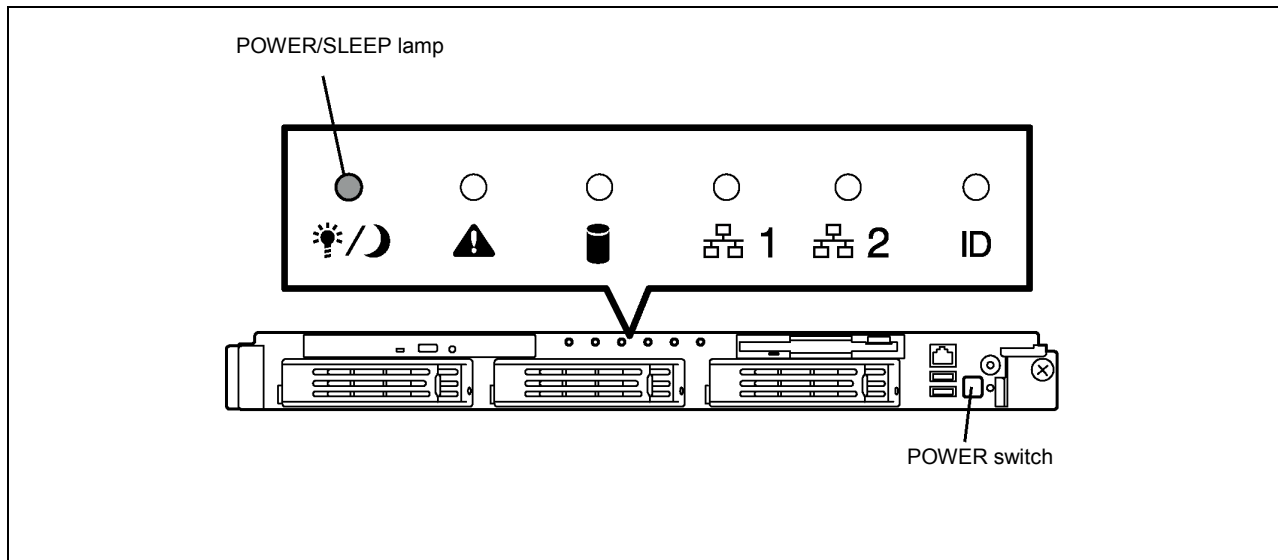
IMPORTANT:

- If the power cord is connected to a power control device such as a UPS (Uninterruptable Power Supply), make sure that the power control device is powered.

- If the power cord is connected to the server, an initial diagnosis of the hardware starts. The POWER switch does not work while in diagnosis mode. Wait for about 10 seconds, then press the POWER switch.

- Do not turn off the server until characters following the "NEC" logo appear on the screen.

POST

POST (Power On Self-Test) is the server's self-diagnostic program stored in the system memory.

When you power on the server, the system automatically runs POST to check the system board, ECC memory module, CPU module, keyboard, and mouse. POST also displays messages of the BIOS setup utility, such as the start-up message, while in progress.

```
                              NEC
```

With the factory setup of the server, the NEC logo appears on the display unit while POST is in progress. (To display the POST check results, press **Esc**.)

> **NOTE:** You can set the POST check results to appear on the display unit without pressing **Esc**. To do so, select "Enabled" for "Boot-time Diagnostic Screen" under the Advanced menu of the BIOS setup utility.

You don't always need to check the POST check results. Check messages that POST displays when:

- You use the server for the first time.
- The server appears to fail.
- The server beeps for many times between power-on and OS start-up.
- An error message appears on the display unit.

POST Execution Flow

The following describes the progress of POST in the chronological order.

IMPORTANT:

- Do not make key entries or perform mouse operations while POST is in progress.

- Some system configurations may display the message "Press Any Key" to prompt a key entry. This message is driven by BIOS of an installed optional board. Make sure to read the manual that comes with the optional board before any key entry.

- Powering on the server, after you installed or removed an optional PCI board or moved it to another slot, may display the massage that indicates incorrect board configuration and suspend POST.
  In such a case, press **F1** to continue POST. Board configuration can be made using the utility described later.

---

1. A few seconds after power-on, POST starts checking the memory. The count message of the basic and expansion memory appears at top left on the display unit screen. The memory check may takes a few minutes to complete depending on the memory size of the express server. Also, it may take approximately one minute for the screen display to appear after rebooting the server.

2. Some messages appear upon completion of the memory check. These messages appear to indicate that the system has detected the CPU, keyboard, and mouse.

3. After a few seconds, POST displays the following message prompting you to launch the BIOS setup utility, SETUP, stored in the system memory of the server. This message appears at bottom left on the screen.

   ```
   Press <F2> to enter SETUP, Press <F12> to Network
   ```

   Launch the BIOS setup utility when you need to change the settings to meet the requirements for the server. As long as the above message is not displayed with an error message, you don't have to launch the utility. (Ignore the message. POST will automatically proceed.)

   To launch the SETUP utility, press **F2** while the above message is displayed. See Chapter 3 for setup and parameters.

   The server automatically restarts POST all over again when you exit the SETUP utility.

   Press **F12** to start the operating system from the network drive.

4. POST then detects the internal SCSI controller and display the massage prompting you to launch the SCSI device utility. (Ignore the message. POST will automatically continue a few seconds later.)

> Press <Ctrl> <A> for SCSISelect(TM) Utility!

To launch the SCSI device utility, press **Ctrl** and **A**. See Chapter 3 for setup and parameters.

You need to use the SCSI device utility when:

– you installed an SCSI device in a 5.25-inch device bay.

– you connected an external SCSI device.

– you changed internal SCSI device connections of the server.

The server automatically restarts POST all over again when you exit the SCSI device utility.

If more than one SCSI controller board is installed on the PCI bus of the server, the system detects the boot devices in order of the PCI riser card slot 1C (for low-profile boards), and then the PCI riser card slot 1B (for full-height boards), and displays the message indicating activation of the SCSI BIOS SETUP utility.

5. POST displays SCSI ID numbers used by the connected SCSI devices on the screen.

6. If an optional disk array controller is installed, the system displays the message prompting you to activate the disk array BIOS SETUP utility. (The start message and operation may vary depending on the mounted board.)

For details, see the manual provided with the board or the online document in the EXPRESSBUILDER CD provided with the server.

7. If you set a password using the BIOS setup utility, SETUP, the password entry screen appears upon successful completion of POST.

Up to three password entries will be accepted. Three incorrect password entries disable the server to boot. In such a case, turn off the power and wait about ten seconds before turning on to boot the server.

> **IMPORTANT:** Do not set a password before installing an OS.

8. The OS starts when POST completes.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. See Chapter 6 for POST error codes.

> **IMPORTANT:** Note the messages displayed before consulting with your service representative. Alarm messages are useful information for maintenance.

Power Off

Follow the procedure below to power off the server. If the power cord of the server is connected to a UPS, refer to the manual that comes with the UPS or the manual for the application that controls the UPS.

> **IMPORTANT:** Always allow POST to complete before turning off the server.

1. Shut down the OS.
2. Press the POWER switch on the front of the server.
   The POWER/SLEEP lamp goes off.
3. Power off peripheral devices.

Identification of Servers ~ UID Switch ~

An "UID (unit ID) lamp" is provided on the front panel and rear panel. If more than one server is mounted in a single rack, the lamp identifies the server you are going to maintain.

The UID lamp goes on when the UID (unit ID) switch on the front panel is pressed. It goes off when the switch is pressed again.

Maintenance from the rear of the rack has to be carried out in a narrow space. Thus, the interface cable of a server or power supply unit may be disconnected by accident. To prevent this problem, you should start maintenance after confirming the target server by using the UID switch.
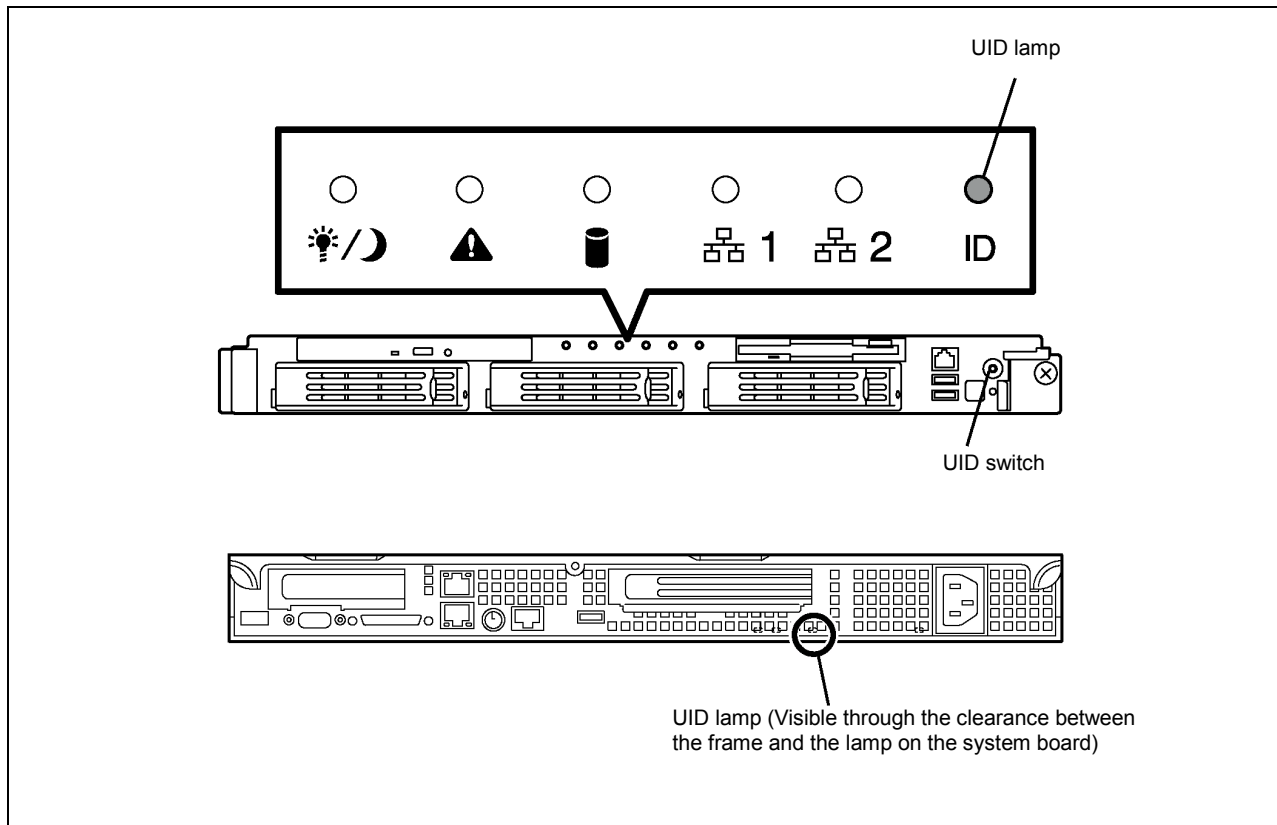
Floppy Disk Drive

The server is provided with the 3.5-inch floppy disk drive.

The server supports the following 3.5-inch floppy disks:

- 2HD floppy disk (double-sided high-density track type)
  Stores data of 1.44MB.

- 2DD floppy disk (double-sided double-density track type)
  Store data of 720KB.

Make sure that the server is powered on (the POWER/SLEEP lamp is lit) before inserting a floppy disk into the floppy disk drive.

When you insert the floppy disk into the floppy disk drive completely, the drive clicks and the eject button on the floppy disk is slightly pushed out.

> **NOTES:**
>
> - When an unformatted floppy disk is inserted, the message notifying that date read is not available and the message prompting formatting are displayed. Refer to the manual that comes with the OS to format the floppy disk.
>
> - If the floppy disk contains a system, powering on or restarting the server with the floppy disk inserted boots the system from the floppy disk.

To eject the floppy disk from the floppy disk drive, press the eject button.

> **NOTE:** Make sure that the floppy disk access lamp is not lit before ejecting the floppy disk. Ejecting the disk when the access lamp is lit may destroy the disk data.

NOTE: Use of the floppy disk

The floppy disk is an important data storage media with delicate structure and requires care. Keep the following information in mind when using it:

■ Insert the floppy disk into the floppy disk drive carefully as far as it goes.

■ Attach the label to the correct position.

■ Do not write anything directly onto the disk surface with a pencil or ball-point pen.

■ Do not open the shutter.

■ Do not use the floppy disk in a dusty place.

■ Do not place anything on the floppy disk.

■ Do not leave the floppy disk in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).

■ Keep the floppy disk away from cigarette smoke.

■ Keep the floppy disk away from any liquid (e.g., water) and chemicals.

■ Keep the floppy disk away from any magnetic objects (e.g., magnet).

■ Do not pinch the floppy disk with a paper clip or drop it.

■ Keep the floppy disk in a floppy disk case that protects it from magnetism and dust.

■ A floppy disk has a write-protect switch that prevents the stored data from accidental erasure. You can read data from a write-protected floppy disk, but you cannot save data into the floppy disk or format it. It is recommended that you should write-protect any floppy disk containing valuable data unless you are about to save data. To write-protect a 3.5-inch floppy disk, use the write-protect switch provided on its back.

Write-protect switch

Write disable   Write enable
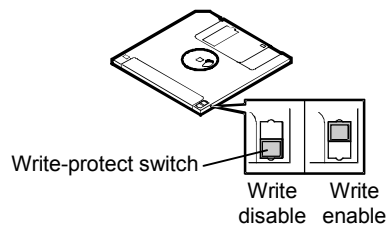
■ The floppy disk is a very delicate storage media. Dust or thermal changes, as well as operator's misconduct or sever failures, may cause loss of data. To avoid loss of data, it is recommended that you should make a back-up copy of your valuable data on a regular basis. (Make sure to make a back-up copy of every floppy disk provided with the server.)

CD-ROM Drive

The server has a CD-ROM drive that allows it to read data from a CD (read-only compact disk). The CD-ROM holds more data and operates faster a floppy disk.

⚠ CAUTION
⚠ 🚫 Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. ■ Do not leave the tray ejected from the CD-ROM drive.

Place a CD on the CD-ROM drive in the following procedure.

1. Confirm that the power of the server is on (with the POWER/SLEEP lamp being lit in green) before placing the CD on the CD-ROM drive.

2. Press the Eject button on the front of the CD-ROM drive.

   The tray slides out a little.

3. Hold the tray lightly and pull it out toward you until the tray stops.
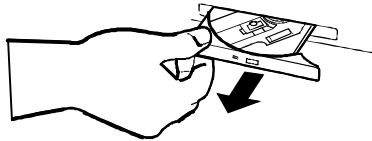
4. Place the CD on the tray carefully and securely with the character printed surface facing upward.
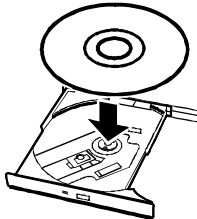
5. As shown in the figure below, hold the tray with one hand and press the CD with fingers of the hand to make the hole of the CD fit directly over the rotor in the center of the tray.

Rotor

Press this part of CD-ROM.
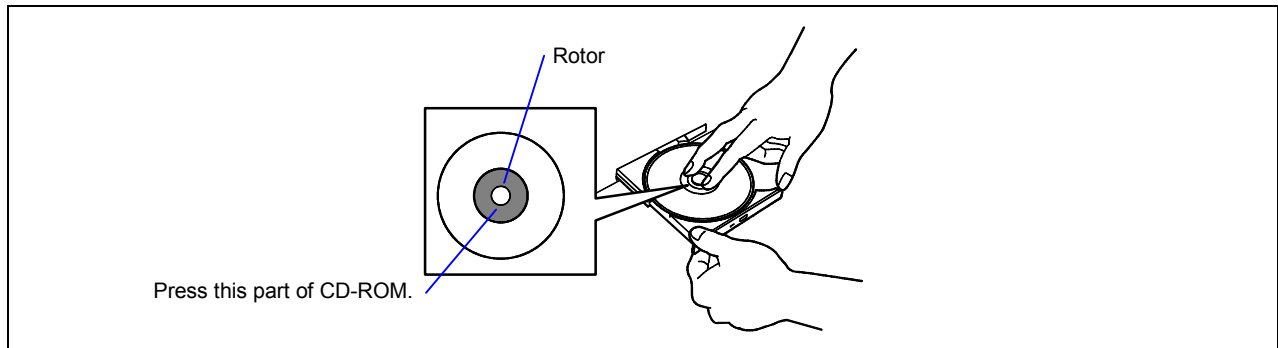
6. Push the front of the tray carefully to retract it into the drive.
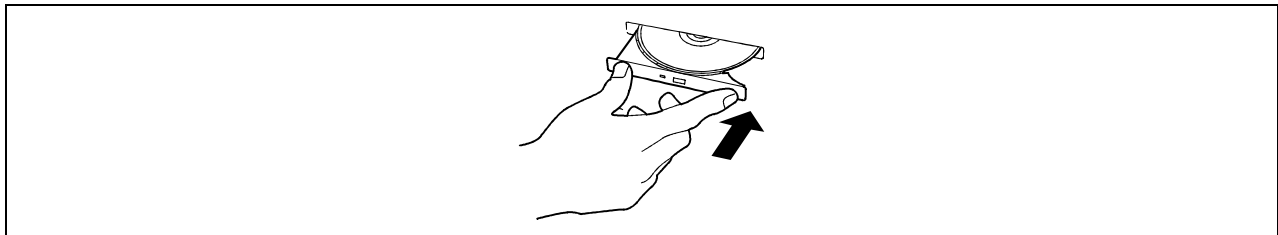
> **IMPORTANT:** If a loud sound in the CD-ROM drive occurs while the tray is retracting into the drive try loading the CD again correctly.

To remove the CD from the CD-ROM drive, press the Eject button.

If the access lamp is lit in orange, the CD is being accessed. Confirm that the access lamp is not lit before pressing the Eject button.

As shown in the figure below, hold the tray with one hand and grasp the end of the CD carefully by the fingers of the other hand with suppression of the rotor at the center of the tray to remove the CD from the tray.
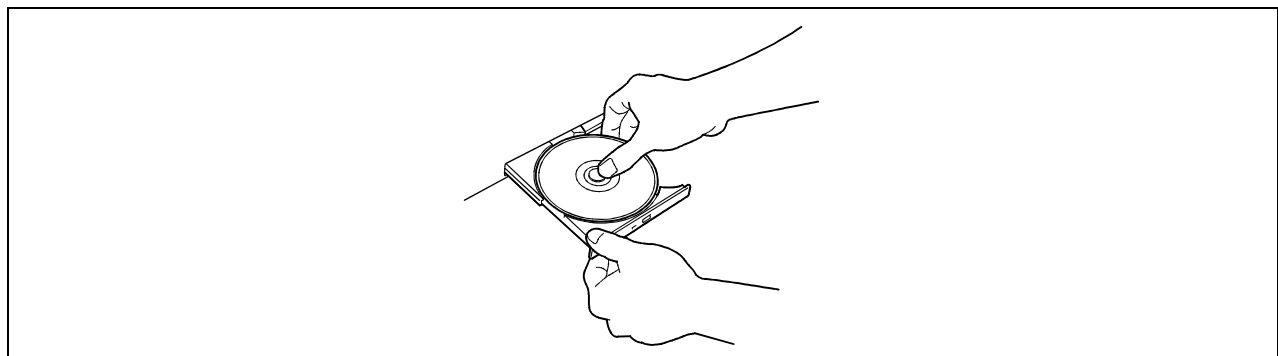
After removing the CD, retract the tray into the drive.

When you fail to eject the CD-ROM tray with the Eject button, follow the procedure below.
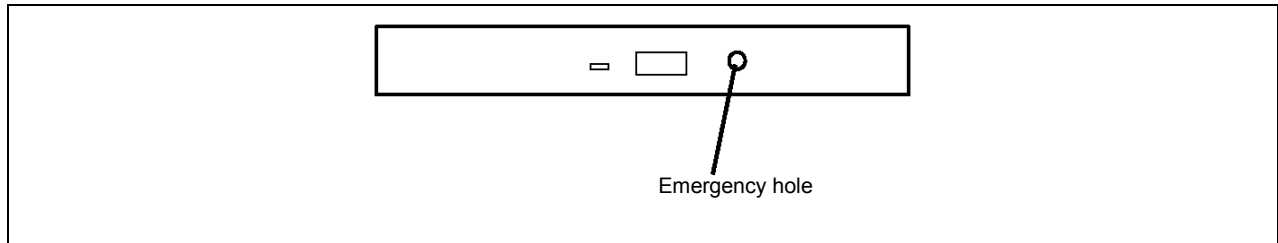
Emergency hole

1. Press the server POWER switch to power off the server. (The POWER/SLEEP lamp goes off.)

2. Insert a metal pin of approximately 1.2 mm in diameter and 100 mm in length (a straightened large paper clip will make a substitute) into the emergency hole on the right front of the CD-ROM drive and gently push it in until the tray is ejected.

   IMPORTANT:

   - Do not use a toothpick or plastic stick that is easy to break.

   - If the above procedure does not allow you take out the CD-ROM, contact your service representative.

3. Hold the tray and pull it out.

4. Take out the CD.

5. Push the tray back into position.

NOTE: WHEN Using the CD

- Do not drop the CD.

- Do not place anything on the CD or bend the CD.

- Do not attach any label onto the CD.

- Do not touch the signal side (nothing is printed on this side) with your hand.

- Place the CD with its printed side upward and gently put it on the tray.

- Do not scratch the CD or write anything directly on it with a pencil or ball-point pen.

- Keep the CD away from cigarette smoke.

- Do not leave the CD in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).

- When dust or fingerprints are attached on the CD, wipe the CD from its center to edge with a dry soft cloth slowly and gently.

- Use the CD cleaner to clean the CD. Do not use record spray/cleaner, benzene, or thinner.

- Keep the CD in a CD case when not in use.

- If the CD- emits loud noise in the CD drive, remove the CD and insert it back again.

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Chapter 2

Setting Up Your System

This chapter describes how to set up your server system.

SETUP FLOW

Follow the flowchart below to set up the server.

Selecting the server site
Select a suitable site for the server.

↓

Unpacking the system
Unpack the server and accessories from the shipping container.

↓

Assembling the rack-mount system
Assemble the 19-inch rack assembly and install the server.

↓

Connecting peripheral devices
Connect peripheral devices to the server.

↓

Connecting the power cord
Connect the power cord to the server.

↓

Turning on the server
Power on the server to start software setups. Setups depend on the optional internal devices installed and the peripheral devices connected.

↓

Installing the operating system
Install an operating system. See Chapter 4.

↓

Installing the utilities
Install the utilities from EXPRESSBUILDER CD-ROM.

↓

Creatin backup copies of system
After all the system setup procedures are completed, make backup copies of the system.
System backup information is required for recovering the server if problems occur or after replacing the system board.

SELECTING A SITE

Installation

Your server unit should be mounted in a standard EIA 19-inch rack cabinet.

Rack Installation

Refer to the documentation attached to the rack or contact your service representative for rack installation of the server unit.

⚠ WARNING

Observe the following instructions to safely use the server. Failure to follow these instructions may result in death or serious personal injury.

■ Do not use the server in any unauthorized place.
■ Do not connect the ground line to a gas pipe.

⚠ CAUTION

Observe the following instructions to safely use the server. Failure to follow these instructions may cause a fire, personal injury, or property damage.

■ Do not carry or install the server by a single person only.
■ Do not install the server where the load may be concentrated on a specific point.
■ Do not install any component on the server by a single person only.
■ Do not pull a device out of the rack if the rack is unstable.
■ Do not leave more than one device pulled out from the rack.
■ Do not exceed the power rate of the wiring.

Before you begin the rack installation review the following guidelines.

Do Not:

- Locate a rack in a narrow space that would inhibit devices from being pulled out from the rack completely.
- Locate the rack on a floor that cannot bear the total weight of the rack and devices mounted in the rack.
- Locate the rack in a place where stabilizers cannot be installed or where the rack can be installed only after proper earthquake-resistant is constructed.
- Locate the rack on an uneven or slanting floor
- Locate the rack in an area that has drastic temperature change (near a heater, air conditioner, or refrigerator).
- Locate the rack where intense vibration may be generated.
- Locate the rack where corrosive gas is generated, chemicals are nearby, or chemicals may be sprayed accidentally.
- Place the rack on a carpet not subject to the anti-static process.
- Locate the rack where some objects may fall on the rack.
- Locate the rack near a device that is generating intense magnetic fields (such as a TV, radio, broadcast/communication antenna, power transmission wire, and electromagnetic crane.) If unavoidable, contact your service representative to request proper shielding.)
- Locate the rack where the power cord of the server must be connected to an AC outlet that shares other devices with large power consumption.
- Locate the rack next to equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). If you must install the server close to such equipment, request your service representative for separate power cabling or noise filter installation.

UNPACKING THE SYSTEM

When you receive your system, inspect the shipping containers prior to unpacking. If the shipping boxes are damaged, note the damage, and if possible, photograph it for reference. After removing the contents of the containers, keep the cartons and the packing materials. If the contents appear damaged when you unpack the boxes, file a damage claim with the carrier immediately.

ASSEMBLING THE RACK-MOUNT SYSTEM

This subsection provides the instructions for mounting the rack-mount server unit into a standard EIA 19-inch rack cabinet.

This subsection also describes the removal procedures for the rack mount server unit from the 19-inch rack cabinet.

⚠ WARNING
Observe the following instructions to safely use the server. Failure to follow these instructions may result in death or serious personal injury.   ■ Do not use the server in any unauthorized place.   ■ Do not connect the ground line to a gas pipe.

⚠ CAUTION
Observe the following instructions to safely use the server. Failure to follow these instructions may cause a fire, personal injury, or property damage.   ■ Do not carry or install the server by a single person only.   ■ Do not install the server where the load may be concentrated on a specific point.   ■ Do not install any component on the server by a single person only.   ■ Do not pull a device out of the rack if the rack is unstable.   ■ Do not leave more than one device pulled out from the rack.   ■ Do not exceed the power rate of the wiring.

Restricted Access Location

The server can be installed in a Restricted Access Location and mounted above non-combustible material.

ESD Precaution

Electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide ESD protection by wearing an antistatic wrist strap attached to chassis ground when handling system components.

Electronic devices can be easily damaged by static electricity. To prevent damage, keep them in their protective packaging when they are not installed in your system.

Checking Components

Check to make sure that six screws (M5 screw, length 10 mm) and eight caged nuts are provided with your server.

> **NOTE:** A screw and a caged nut are shipped with the optional cable arm.

Required Tools

A #2 Phillips screwdriver is recommended for assembling the rack-mount system.

Installation Procedure for NEC Rack or Vendor's Rack

Installation

This server can be installed in either the NEC rack or a vendor's rack. The following procedure describes hoe to install the server in the rack:

> **IMPORTANT:** When installing the cable arm, see the instruction manual provide with the cable arm assembly.

Removing the Rail Assemblies

1. Remove the sliding rails from the server.

2. Hold the rails and slowly slide them toward the rear of the server until a "click" is heard. The click indicates that the rails are locked.
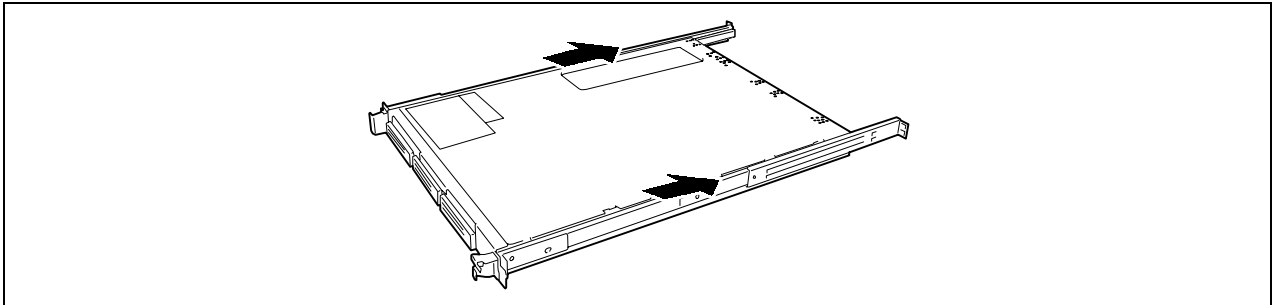
3. Push the release levers on the right and left sides of the server, and remove the rail assemblies from the server while unlocking.

Release lever
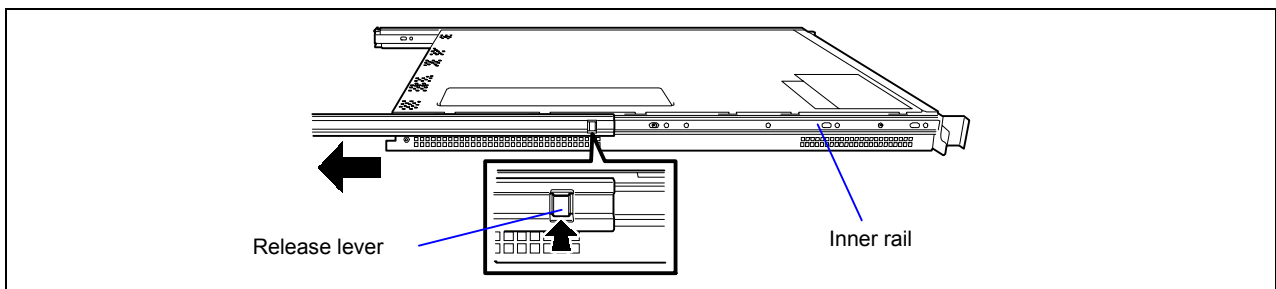
Inner rail

Only the inner rails remain screwed to the server when the rail assemblies have been removed.

> **IMPORTANT:** The removed rail assemblies will be installed on the inner rails later. To install each rail assembly on the correct inner rail, make a mark on the assemblies. Similarly, when installing more than one server, distinguish between the pairs of inner rails and rail assemblies of the servers by making marks.

Installing the Caged Nuts

1. Install two caged nuts on the front of the rack for each of the right and left sides and also two caged nuts on the rear of the rack for each of the right and left sides. Accordingly, eight screws are installed in total.

2. Install two caged nuts in 1U (the minimum unit of rack height). Three slots (angle holes) are opened per 1U of a rack. Install the caged nuts at the upper two slots among the three slots. (For any NEC rack, round marks are put in the unit of 1U.) For two caged nuts installed on the front of the rack, the upper nut is used to fix the front of the rail assembly, and the lower is used to support the set screw of the server. The caged nuts installed on the rear of the rack are used to fix the rear of the rail assemblies.

Marking

1U

Caged nuts   Caged nuts

FRONT   REAR
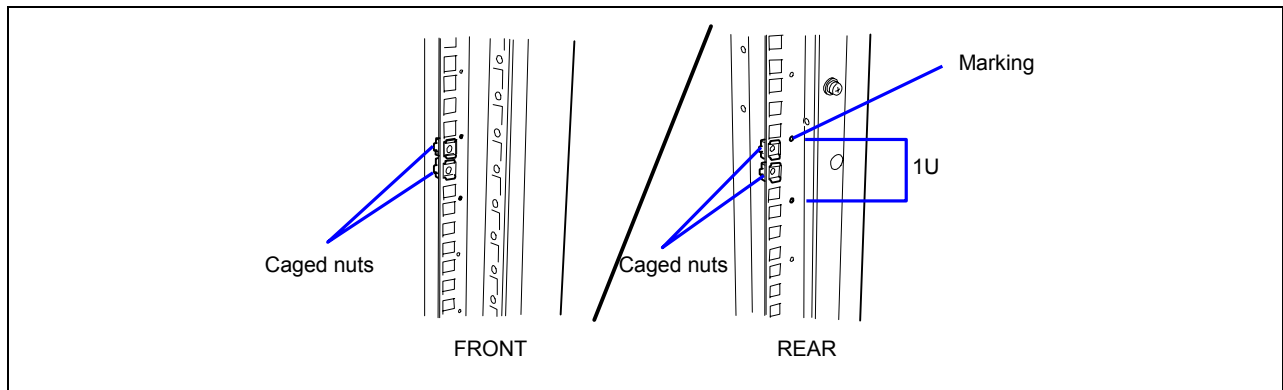
3. Hang either clip of a caged nut on a square hole on the rack and insert another clip into the hole by using a tool such as a flat tip screwdriver.

> **NOTE:** Confirm that all the caged nuts are installed at the level.
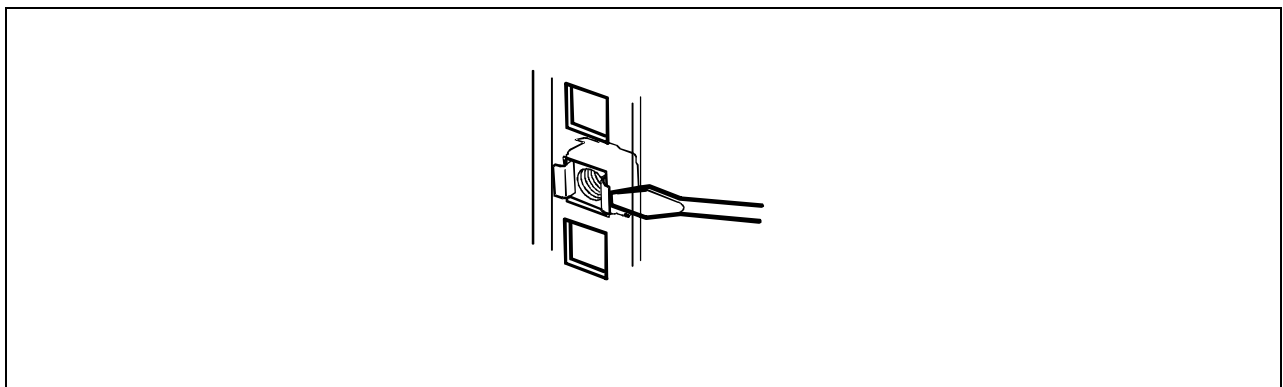
4. If using the cable arm shipped with your system, install three caged nuts on the right frame at the rear of the rack. An additional caged nut is provided with the cable arm shipped with your system.

Install three caged nuts
in the frame slots for 1U
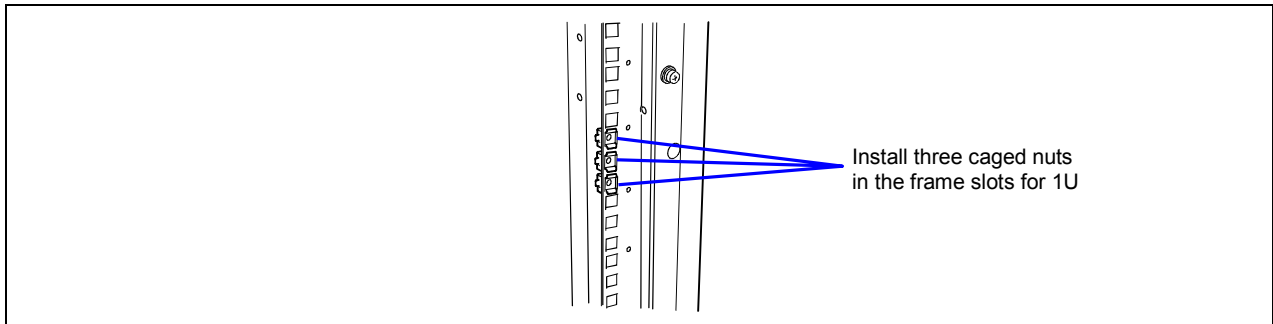
Installing the Rail Assemblies

1. Position the front and rear frames of the rail assembly so that their mounting holes align up with the caged nuts are installed.

Locate the rail assembly so that the frame of the rack is located between caged nuts and frames of rail assembly.

> **NOTE:** Confirm that the portion of the frame to fix the rail assembly is located in front of the rack frame.
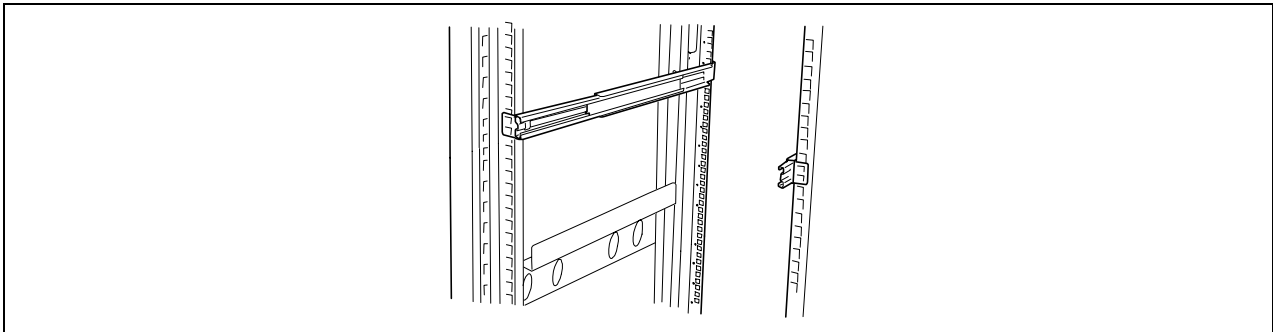
2. Hold the rail assembly and secure the front of the rail assembly with one screw and the rear of the rail assembly with two screws, while holding the rail assembly.
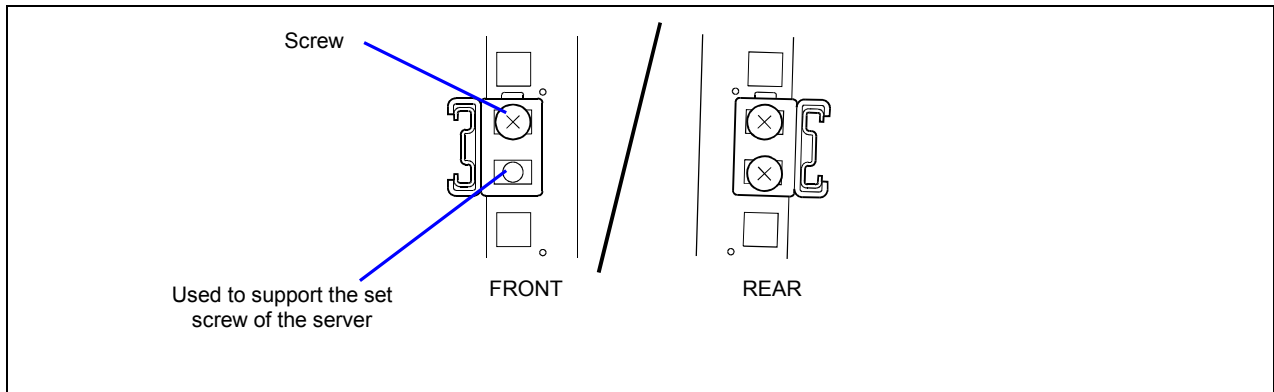
> **NOTE:** Confirm that the rail assemblies are located at the level.

Secure the rear of the assembly after adjusting the depth of the rack and length of the rail assembly.
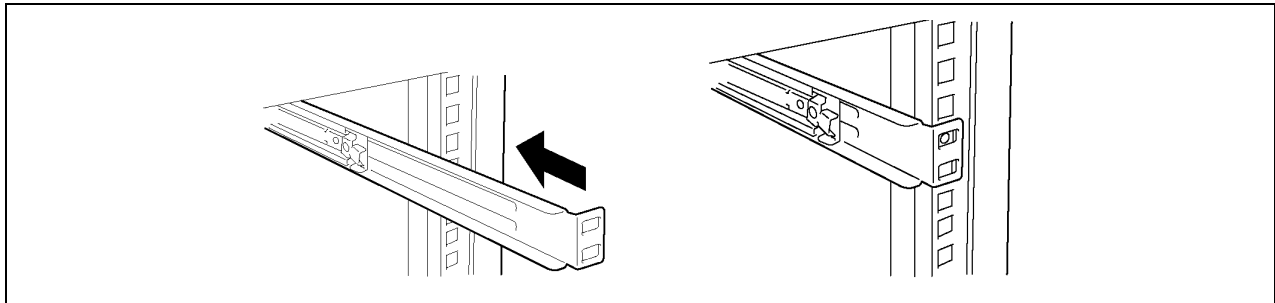
3. Install another rail assembly on the rack in the same way as described in steps 1 and 2 above.

> NOTE: Confirm that the rail assembly is installed at the same level as that of the rail assembly already installed.

Installing the Server

1. Pull out the sliding rails of the right and left rail assemblies until they are locked.
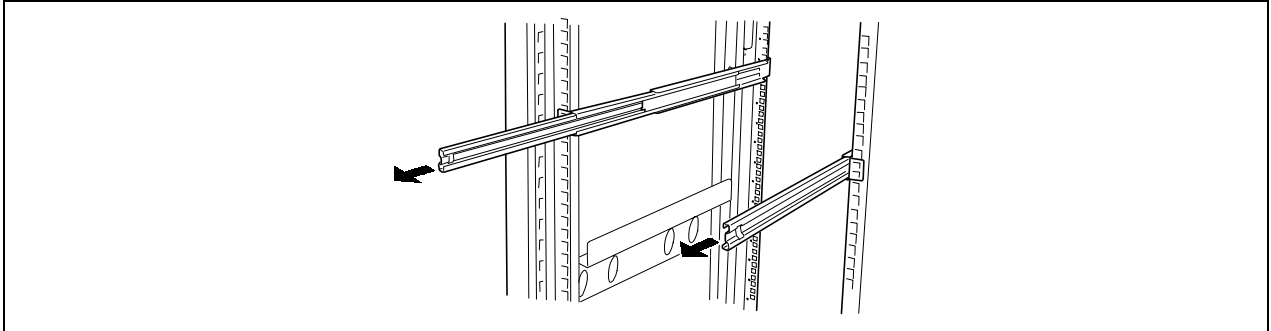
2. At least two persons are required to install the server. Securely the server with its front side facing toward you.

3. Firmly fit the inner rails on the sides of the server into the rail assemblies, and then slowly push the server into the rack.

The server is locked on its way into the rack.

Inner rail   Slide rail
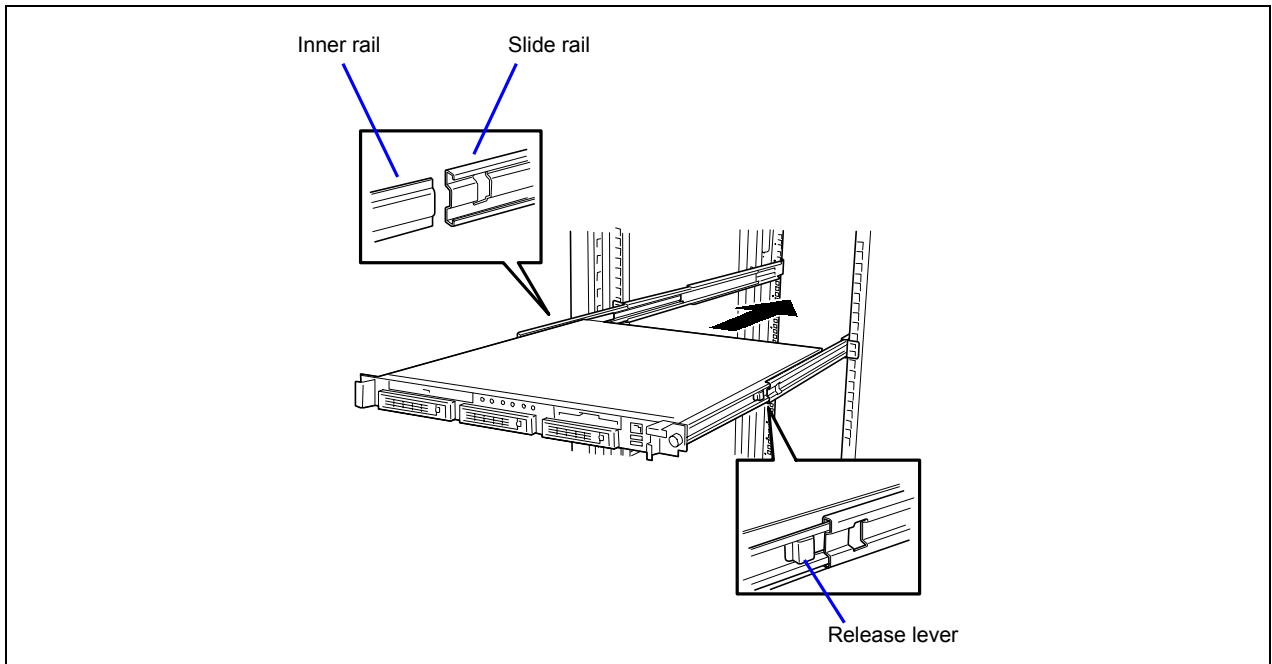
Release lever

4. Push the server in while pressing the release levers on the right and left sides of the server.

> **NOTE:** When the server is installed for the first time, the mechanical parts are rather hard to slide. You may feel strong friction when pushing in the server. In this case, strongly push it in.

Securing the Server

1. Push the server into the rack as far as it will go.

2. Tighten the right and left set screws on the front panel to secure the server to the rack.

Set screws
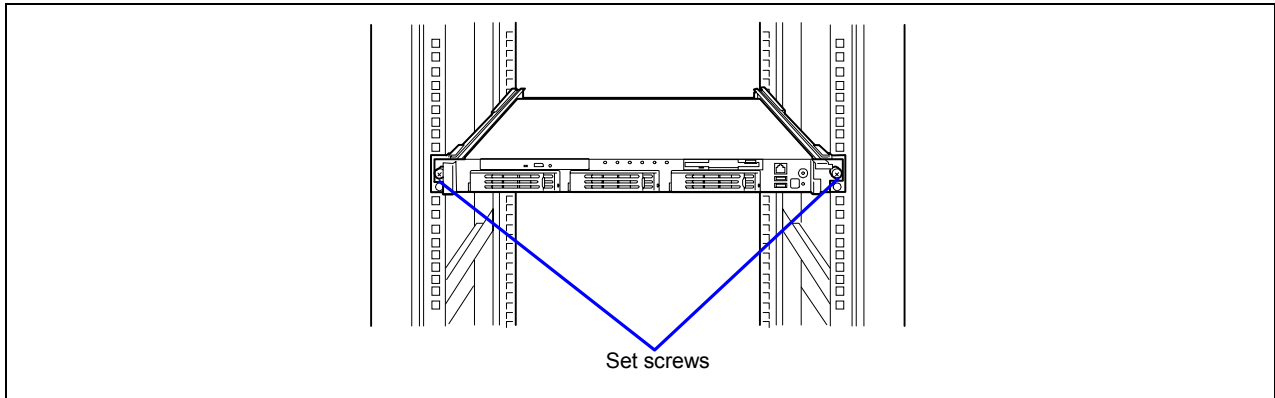
3. Install the front bezel.

This completes the installing of the server.
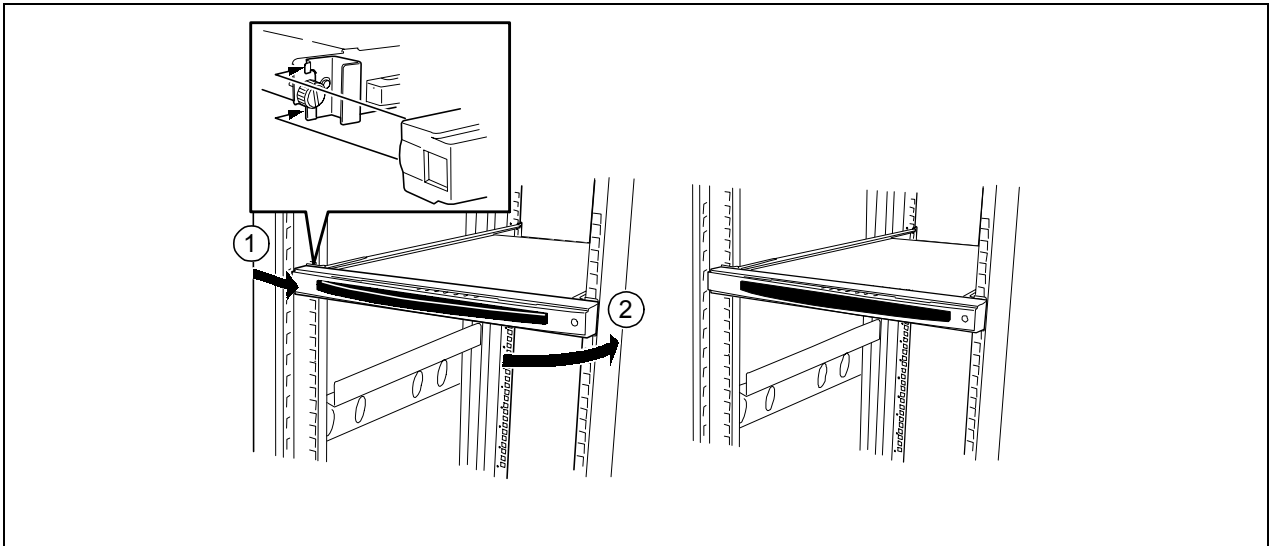
Removing the Server from the Rack Assembly

Use the following procedure to take out the server from the rack:

⚠ WARNING
Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury.   ■ Do not lift the server only by a single person.   ■ Do not pinch your finger with mechanical components.   ■ Do not apply any load on the server pulled out from the rack.   ■ Do not pull out a device from the rack if the rack is unstable.   ■ Do not leave more than one device being pulled out from the rack.   ■ Do not pull out the server from the rack while it is operating.

1. Confirm that the power of the server is OFF, and disconnect the power cable and all the interface cables connected to the server.

2. Remove the front bezel.
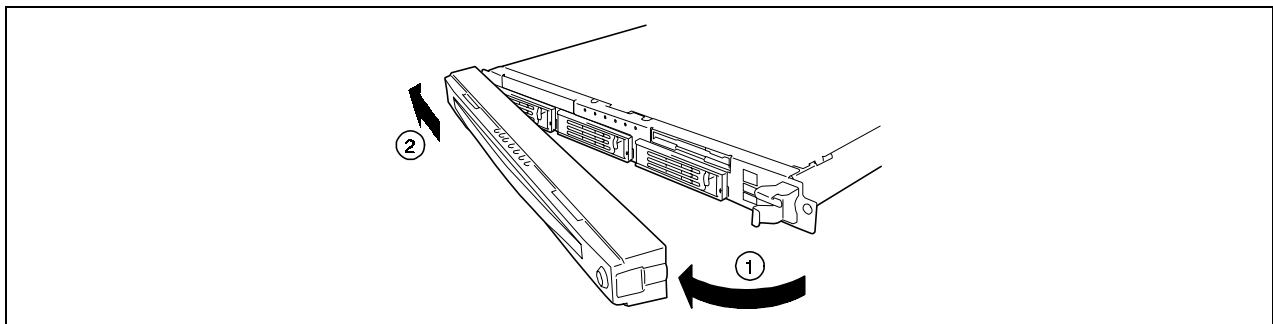
3. Loosen two front screws.

Set screws
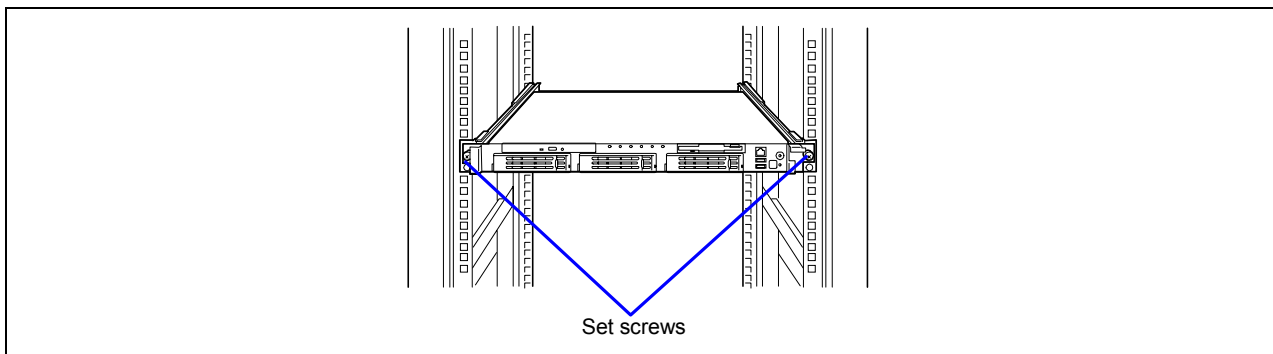
4. Pull out the server from the rack slowly and carefully.

The server clicks to be latched.

> **IMPORTANT:** Do not apply any load on the server pulled out from the rack. Doing so may cause personal injury if the server drops.
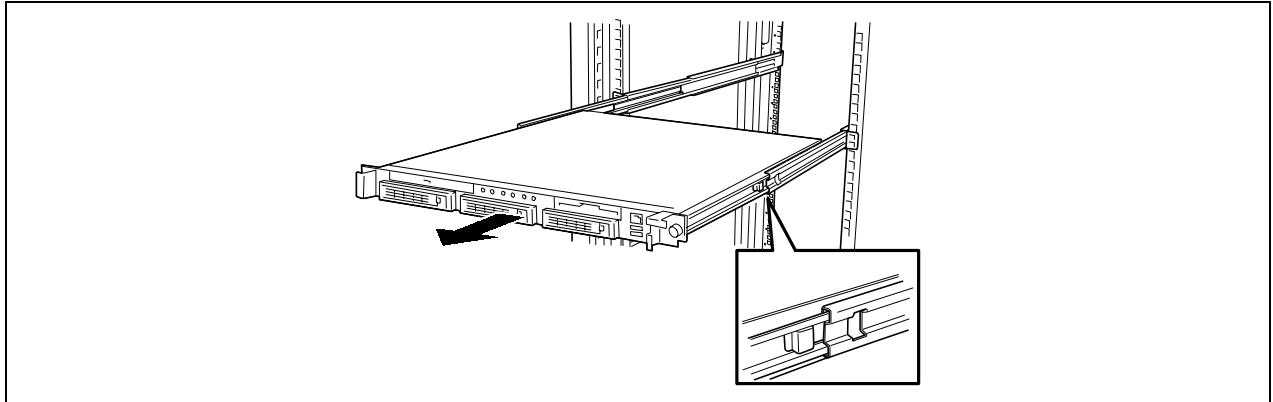
5. Pull out the server from the rack with the right and left release lever pressed to release the latch.

6. Hold the server and pull it out from the rack.

To remove some mechanical parts of the rack, see the installation procedure.

CONNECTING PERIPHERAL DEVICES

Connect peripheral devices to the server. The server is provided with connectors for wide variety of peripheral devices on its front and rear. The figure on the next page illustrates available peripheral devices for the server in the standard configuration and locations of the connectors for the devices.

> **⚠ CAUTION**
>
> Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.
>
> ■ Do not connect any interface cable with the power cord of the Express Server plugged to a power source.
> ■ Do not use any unauthorized interface cable.

IMPORTANT:

- Power off the server and a peripheral device before connection. Connecting a powered peripheral device to the powered server will cause malfunctions and failures.

- To connect a third-party peripheral device or interface cable to the server, consult with your service representative for availability of such a device or cable. Some third-party devices may not be used for the server.

- The "100BASE-TX/10BASE-T connector" and the "serial port 2 connector" of this server have the same shape. Be careful not to connect a cable to a wrong connector. To prevent wrong connection, write "LAN port" on a tag and put the tag to the connector of the LAN cable that is to be connected to this server.

- The total length of a cable (including the connection cable in SCSI device) is limited by the SCSI standard. Ask your sales representative for details. (The internal cable of the server is 0.5 m long.)

- A leased line cannot be connected directly to the serial port connectors.

- Secure the power cord(s) and interface cables with a tie wrap.

- Form the cables in such a way that they will not come into contact with the door or the guide rails on the sides of the server.

USB device [1]

Device with the serial interface (e.g., Management PC) [2]

FRONT

Device with the SCSI interface

USB device [1]

Keyboard

Mouse

Device with the serial interface [2]

Finally connect the provided power cord to the receptacle. [4]
If connecting the server to UPS, see the explanation below.

*3

REAR

Display unit

Hub
(multiport repeater)

USB device [1]
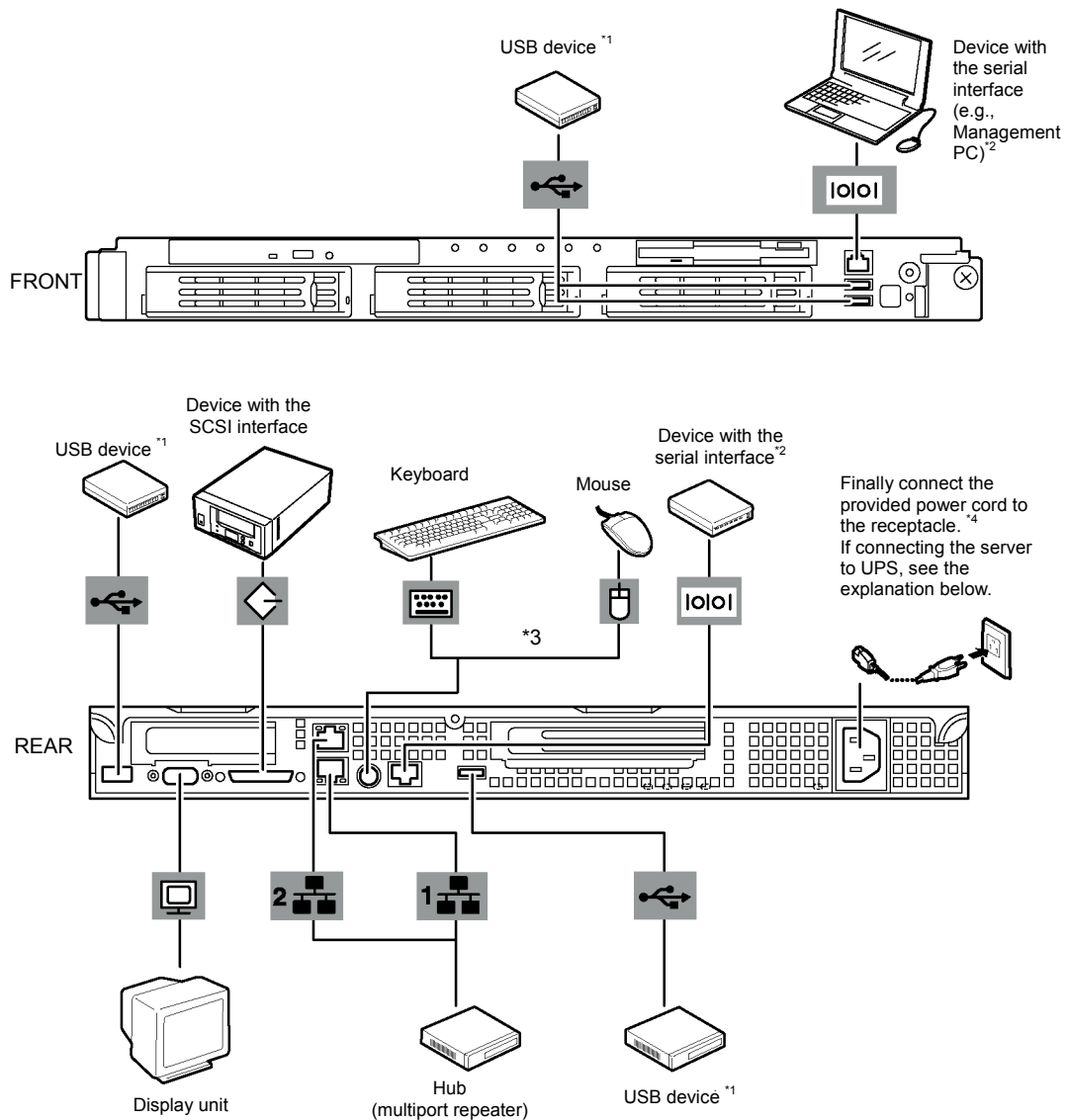
*1 Windows NT 4.0 needs the compliant driver. Any USB keyboard and mouse are not supported.
*2 A leased line cannot be connected directly to this connector.
    The console of a management PC can be connected to only serial port 2. (BIOS setting required)
    This connector is capped for preventing incorrect connection in the standard status.
*3 Use the provided branch cable.
*4 Connect the power cord to a circuit breaker of 15 A or less.

NOTE: Make sure of the cable you are going to connect. The "100BASE-TX/10BASE-T connector" and the "serial port 2 connector" of this server have the same shape. Be careful not to connect a cable to a wrong connector. To prevent wrong connection, write "LAN port" on a tag and put the tag to the connector of the LAN cable that is to be connected to this server.

Connection to Serial Ports

Various types of serial devices can be connected to the RJ-45 serial ports on the front and rear panels of the server. Some devices require the setting of the jumper pin (J6A2) on the system board to be changed according to the DCD/DSR signal specification, or they need to be connected via an optional serial port conversion cable.

A set of two optional serial port conversion cables is provided with the server. The F (Front) label is attached to one cable, and the R (Rear) label is attached to the other cable.

> **IMPORTANT:** Inter-equipment potential difference may cause a server failure. Be sure to turn off the server and the connection-destination equipment and disconnect the power cord before connecting/disconnecting the cable to/from the serial port.

The figure in the next page shows the location of the jumper pin (J6A2). For instructions on how to remove the cover and other internal components, see Chapter 7.
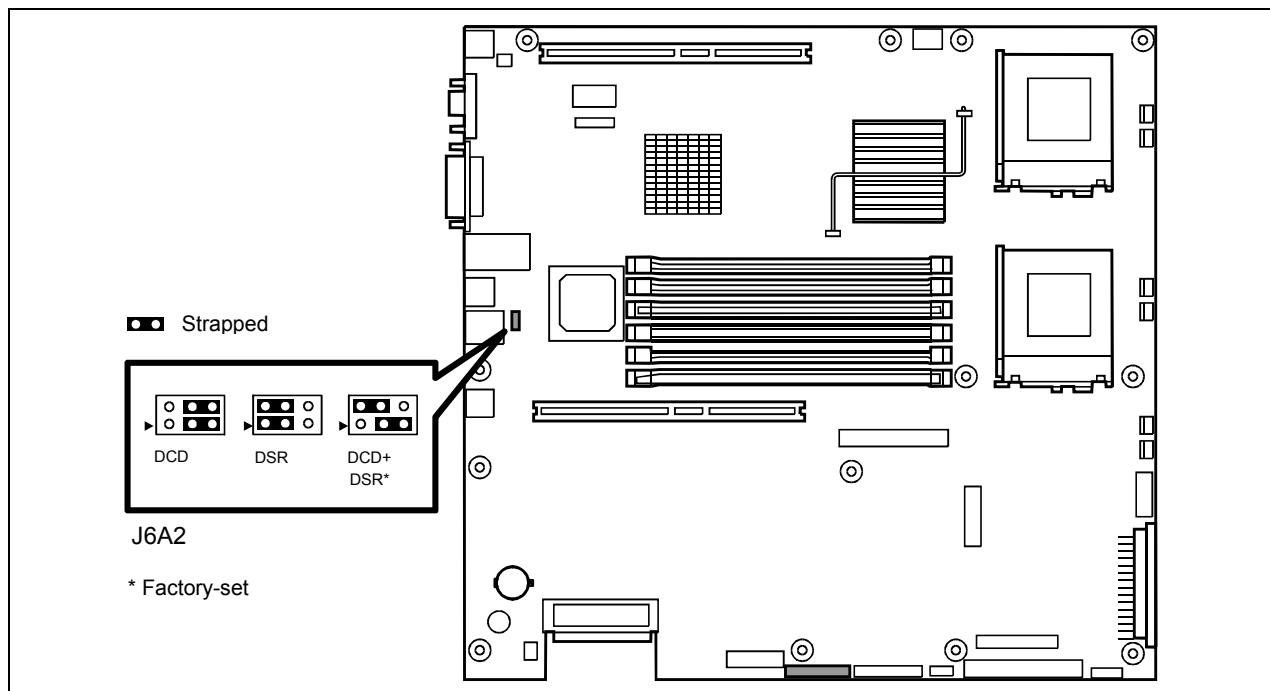
Connection between the Front Serial Port and a Management PC (DB9)

To connect equipment such as a management PC having a DB9-type serial connector to the system via the serial port on the front panel, use the optional "serial port conversion cable" with the "F" label attached. Be careful not to use the other one with the "R" label attached.

> **NOTE:** You do not have to change the setting of the jumper pin when connecting to the serial port on the front panel of the server.

Connection between the Rear Serial Port and a Modem

To connect a modem to the serial port on the rear panel, use the optional "serial port conversion cable" with the "R" label attached. Be careful not to use the other one with the "F" label attached. Set the jumper pin to "DCD+DSR" (factory-set).

> **IMPORTANT:** Make sure of the icon on the rear panel of the server, and be sure to connect the cable to serial port 2. Be careful not to connect to a LAN port by mistake.
> To prevent wrong connection, write "LAN port" on a tag and put the tag to the connector of the LAN cable that is to be connected to this server.

Connection between the Rear Serial Port and a UPS

To connect a UPS to the serial port on the rear panel, use the optional "serial port conversion cable" with the "R" label attached. Be careful not to use the other one with the "F" label attached. Set the jumper pin to "DCD+DSR" (factory-set).

> **IMPORTANT:** Make sure of the icon on the rear panel of the server, and be sure to connect the cable to serial port 2. Be careful not to connect to a LAN port by mistake.
> To prevent wrong connection, write "LAN port" on a tag and put the tag to the connector of the LAN cable that is to be connected to this server.

Connection between the Rear Serial Port and a Management PC (DB9), etc.

To connect equipment such as a management PC having a DB9-type serial connector to the serial port on the rear panel, use the optional "serial port conversion cable" with the "R" label attached. Be careful not to use the other one with the "F" label attached. Set the jumper pin to "DCD+DSR" (factory-set).

> **IMPORTANT:** Make sure of the icon on the rear panel of the server, and be sure to connect the cable to serial port 2. Be careful not to connect to a LAN port by mistake.
> To prevent wrong connection, write "LAN port" on a tag and put the tag to the connector of the LAN cable that is to be connected to this server.

Connection between the Rear Serial Port and a DCD/DSR Signal Device

If a "terminal concentrator" or similar device is to be connected to the serial port on the rear panel, thoroughly read its instruction manuals before making the cable connections. Refer to subsection "Connection to Serial Ports" earlier in this chapter in order to set the jumper pin of this server to "DCD" or "DSR". They must be set in accordance with the signal that the connection-destination equipment requires.

IMPORTANT:

- Make sure of the icon on the rear panel of the server, and be sure to connect the cable to serial port 2. Be careful not to connect to a LAN port by mistake.

- To prevent wrong connection, write "LAN port" on a tag and put the tag to the connector of the LAN cable that is to be connected to this server.

- Be sure to observe the following items to prevent damage to this server and the peripheral device:

  – When using a shielded cable (STP cable), confirm that the connector of the connection-destination equipment is compatible with the STP cable. Connect the equipment to the server through an STP cable of up to 15 m.

  – When using an unshielded cable (UTP cable), confirm that the connection-destination equipment is mounted in the rack of the server or a rack linked with the server rack. Connect the equipment to the server through a UTP cable of up to 15 m.

  – To prevent wrong connection, write "Serial port" on a tag and put the tag to the connector of the serial cable that is to be connected to this server.

- It is hard to press the catch of the connector with your finger that is connected to the serial port. Disconnect the connector pressing the catch with a standard screwdriver. At this time, be very careful for the screwdriver not to damage the LAN port or other ports.

CONNECTING THE POWER CORD

Connect the power cord to the server.

⚠ WARNING
Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. ■ Do not hold the power plug with a wet hand. ■ Do not connect the ground wire to a gas pipe.

⚠ CAUTION
Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. ■ Do not plug the power cord in to an improper power source. ■ Do not connect the power cord to an outlet that has an illegal number of connections. ■ Insert the power plug into the outlet as far as it goes. ■ Use the authorized power cord only.

1. Plug the provided power cord into the power receptacle on the rear of the server.

2. Plug the other end of the power cord into the wall outlet.

> **IMPORTANT:** Secure the power cord with a tie wrap.

To connect the power cord from the server to an interruptive power supply (UPS), use service outlets on the rear of the UPS.

The UPS service outlets are categorized into two groups: SWITCH OUT and UN-SWITCH OUT. (They may be called "OUTPUT1" and "OUTPUT2".)

To control power supply with an application (ESMPRO/UPSController) that controls the UPS, connect the power cord to an SWITCH OUT outlet.

For constant power supply, connect the power cord to a UN-SWITCH OUT outlet. (Connect the modem that is in service for 24 hours to this outlet.)

<Example>
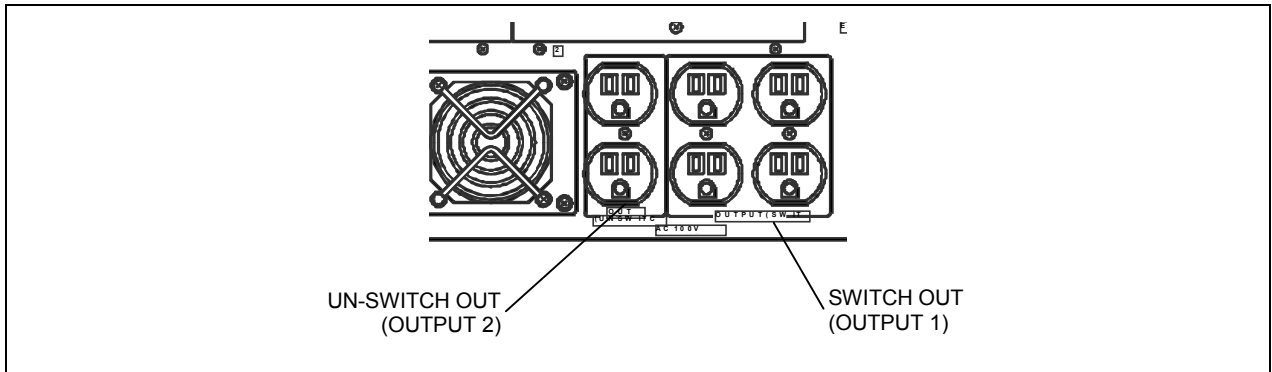
When the power cord from the server to a UPS, change the BIOS setup of the server to link with power supply from the UPS.

Change a parameter for "After Power Failure" under the System Hardware menu of the BIOS setup utility. See Chapter 3 for details.

TURNING ON THE SERVER

Turn on the server and follow the on-screen instructions for setup.

> **IMPORTANT:** Before turning on the server:
>
> - Some optional boards require setups with the SETUP utility before installation. If the server has a PCI board with the PCI-to-PCI bridge installed, the SETUP utility is enabled to launch. Check on the board specifications to find out whether it requires pre-installation setups before actually installing the board.
>
> - Some installed optional devices or connected peripheral devices require setups before proceeding to the next step.
>
> To use the server with no optional devices installed besides the graphic board, install a desired OS to the server.

1. Make sure all external devices, such as a video display, keyboard, and mouse (optional) have been connected, and the power cords are connected.

2. Power on the video display and any other external devices.

3. Make sure that the floppy disk drive contains no floppy disk and the CD-ROM drive contains no bootable CD-ROM.

4. Open the front bezel.

5. Press the POWER switch.

> **NOTES:**
>
> - If the power cord is connected to the power control unit such as the UPS, turn on the power control unit.
>
> - Connect the power cord and wait a few seconds before pressing the POWER switch. The POWER switch does not work in a few seconds after connecting the power cord due to BMC (Baseboard Management Controller) firmware start-up.
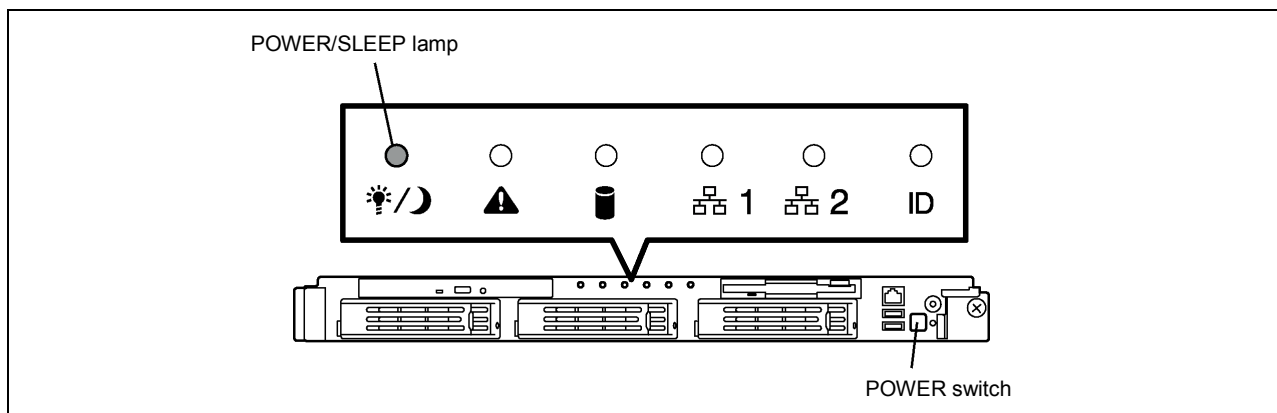
The POWER lamp on the front of the server comes on.

In a few seconds, the NEC logo appears on the screen and the Power On Self-Test (POST) begins.

The POST runs automatically when you power on the server or reset it with a keyboard operation (**Ctrl** + **Alt** + **Delete**). The POST runs diagnostics, initializes the server, sets interrupt vectors, detects installed peripheral devices, and boots the operating system (if installed). See Chapter 1 for detailed description on POST.

If the server halts before completing the POST, the POST emits a beep code indicating a fatal system error requiring immediate attention. (See Chapter 6, "Troubleshooting," for troubleshooting information.)

During memory test, the POST displays the amount of memory it was able to access and test. Depending on the amount of installed memory, it may take several minutes to complete the memory test.

> **NOTE:** The factory-set is defined to hide the POST screen with the NEC logo screen. You can always change the NEC logo screen to the POST screen by pressing **Esc**. To change the start-up screen, use the BIOS setup utility, "SETUP." (See Chapter 3 for details.)

During the POST, you will see the banner message to prompt you to launch the BIOS SETUP utility stored in ROM on system board or on an installed option board.

Start the BIOS SETUP utility appropriate to your system environment to change the BIOS setup. For the BIOS SETUP for the server, see Chapter3. For the BIOS SETUP for the option board, refer to the manual that comes with the option board.

INSTALLING THE OPERATING SYSTEM

See Chapter 4 for installing the following operating systems.

- Microsoft Windows 2000

- Microsoft Windows NT 4.0

- Novell NetWare

- SCO OpenServer™ 5.0.X

To install operating systems not listed above, contact your service representative.

IMPORTANT:

- Use EXPRESSBUILDER for initial setup of your server. EXPRESSBUILDER is a support software for the NEC Express5800 server. It simplifies the process of installing and configuring your server. See the electronic "EXPRESSBUILDER User's Guide" on the EXPRESSBUILDER CD-ROM for details on EXPRESSBUILDER.

- Before installing the operating system, adjust the system date and time by using the BIOS setup utility "SETUP." See the next chapter for detail.

INSTALLING UTILITIES

Install the utilities that come with the server. See "Installing and Using Utilities" on the EXPRESSBUILDER for details.

MAKING BACKUP COPIES OF SYSTEM INFORMATION

The system information includes the current BIOS settings and any specific information for the server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

1. Set the CD-ROM "NEC EXPRESSBUILDER" in the CD-ROM drive and reboot the system.

2. Select [Tools].

3. Select [Off-line Maintenance Utility].

4. Select [System Information Management].

5. Set a floppy disk in the floppy disk drive.

6. Select [Save].

Chapter 3

Configuring Your System

This chapter describes the Basic Input Output System (BIOS) configuration.

When you install the server for the first time or install/remove optional devices, thoroughly read this chapter for better understanding and correct setups.

SYSTEM BIOS ~ SETUP ~

The SETUP utility is provided to make basic hardware configuration for the server. This utility is pre-installed in the flash memory of the server and ready to run.

The server is configured with the correct parameters using the SETUP utility and shipped in the best conditions. Thus, you don't need to use the SETUP utility in most cases. However, you might wish to use the SETUP utility in the cases described below.

IMPORTANT:

■ The SETUP utility is intended for system administrator use only.

■ The SETUP utility allows you to set a password. The server is provided with two levels of password: Administrator and User. With the Administrator password, you can view and change all system parameters of the SETUP utility. With the User password, system parameters available for viewing and changing are limited.

■ Do not set any password before installing the OS.

■ The server contains the latest version of the SETUP utility. Dialog boxes appear on your SETUP utility, thus, may differ from descriptions in this User's Guide. If you find anything unclear, see the online help or ask your sales representative.

Starting SETUP Utility

Powering on the server starts POST (Power On Self-Test) and displays its check results. If the NEC logo is displayed, press **Esc**.

After a few seconds, the following message appears at bottom left on the screen.

> Press <F2> to enter SETUP

Press **F2** to start the SETUP utility and display its Main menu.

If you have previously set a password with the SETUP utility, the password entry screen appears. Enter the password.

> Enter password:[   ]

Up to three password entries will be accepted. If you fail to enter the password correctly for three consecutive times, the server halts. (You can no longer proceed.) Power off the server.

> **NOTE:** The server is provided with two levels of password: Administrator and User. With the Administrator password, you can view and change all system parameters. With the User password, system parameters available for viewing and changing are limited.

Description on On-Screen Items and Key Usage

Use the following keyboard keys to work with the SETUP utility. (Key functions are also listed at the bottom of the screen.)

Indicates the current menu.

BIOS Setup Utility

| Main | Advanced | Security | Server | Boot | Exit |

Setup Warning
Setting items on this screen to incorrect values
may cause your system to malfunction!

Additional setup menus
to configure PCI
devices.

▶ PCI Configuration
▶ Peripheral Configuration
▶ Memory Configuration
▶ Advanced Chipset Control
Reset Config Data: [No]
Numlock: [Off]

Online help
window

Indicates there
are submenus.

Setup item
menu

← →	Select Menu
↑ ↓	Select Item
F9	Setup Defaults
F10	Save and Exit
ESC	Exit

Explanation of
key functions
menu

Parameter (high-lights upon selection) menu

Cursor (↑, ↓):	Selects an item on the screen. The highlighted item is currently selected.
Cursor (←, →):	Selects the Main, Advanced, Security, Server, Boot, or Exit menu.
– and **+:**	Changes the value (parameter) of the selected item. When a submenu option (an option preceded by "™") is selected, these keys are disabled.
Enter	Press **Enter** to select (determine) parameters.
Esc	Displays the previous screen.
F1:	Press **F1** when you need help on SETUP operations. The help screen for SETUP operations appears. Press **Esc** to return to the previous screen.
F9:	Sets the parameter of the currently displayed item back to the factory set parameter.
F10:	Sets the parameter back to the one stored by the server before the SETUP utility was started.

Configuration Examples

The following describes examples of configuration required to use software-link features or for system operations.

Date and Time

To display system date or time

Select [Main] - [System Time], [System Date].

Link with Management Software

To link with temperature monitoring feature of ESMPRO

Select [Server] - [Temperature Sensor] - [Enabled].

To control power supply of the server with ESMPRO Manager via the network

Select [Advanced] - [Advanced Chipset Control] - [Wake On Lan] - [Enabled].

UPS

To link power supply with the UPS

- To power on the server when power is supply from the UPS

    Select [Server] - [After Power Failure] - [Power On].

- To keep the server off-powered even when power is supplied from the UPS if the POWER switch was used to power off

    Select [Server] - [After Power Failure] - [Last State].

- To keep the server off-powered even when power is supplied from the UPS

    Select [Server] - [After Power Failure] - [StayOff].

Boot

To change the boot order of devices connected to the server

Select [Boot] and specify the boot order.

To display POST check results

Select [Boot] - [Quiet Boot] - [Disabled].

You can also press **Esc** while the NEC log is on the screen to display POST check results.

To use remote wake-up feature

■ Via Modem:

Select [Advanced] - [Advanced Chipset Control] - [Wake on Ring] - [Enabled].

■ Via LAN:

Select [Advanced] - [Advanced Chipset Control] - [Wake on LAN] - [Enabled].

■ Via PCI device:

Select [Advanced] - [Advanced Chipset Control] - [Wake on PME] - [Enabled].

■ Via RTC alarm:

Select [Advanced] - [Advanced Chipset Control] - [Wake on RTC Alarm] - [Enabled].

To control from the HW console

Select [Boot] - [Quiet Boot] - [Disabled].

Select [Server] - [Console Redirection] and set each item.

Memory

To enable the memory degradation feature

Select [Advanced] - [Memory Configuration] - [Extended Memory Test] - [Every-Location].

To check the installed memory (DIMM) status

Select [Advanced] - [Memory Reconfiguration] - [Bank #n] and check the status indications. (n: 1 - 3)

The on-screen DIMM numbers and socket locations on the system board are associated as shown in the figure below.
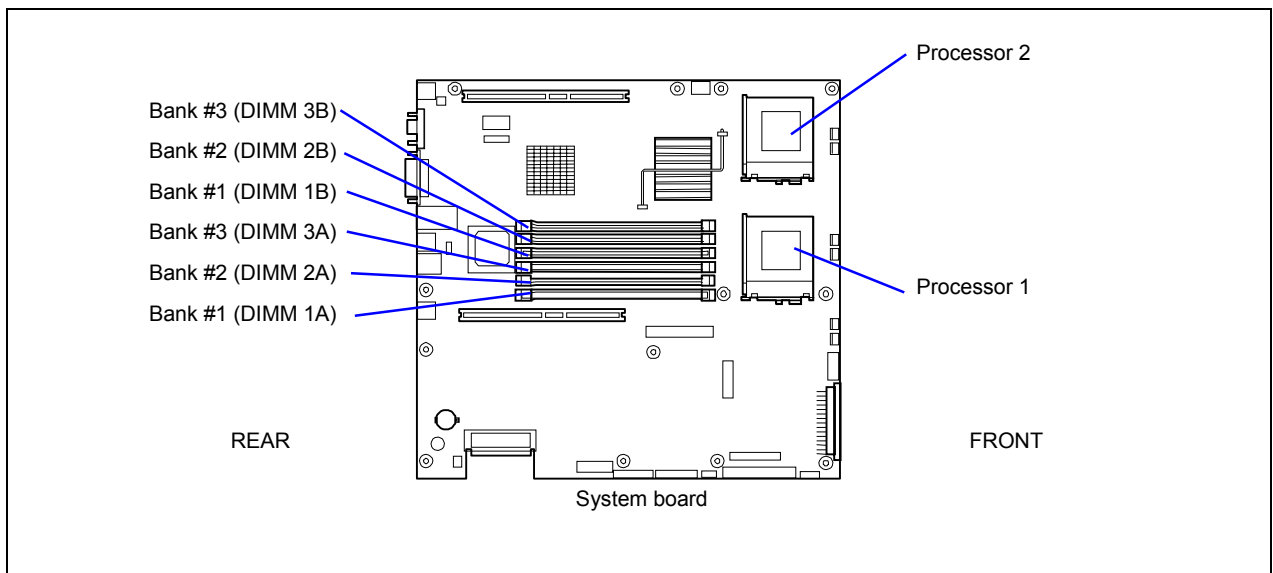
To clear the memory (DIMM) error information

Select [Advanced] - [Memory Configuration] - [Memory Retest] - [Enabled] and reboot the server.

CPU

To check the installed CPU status

Select [Main] - [Processor Settings] and check the status indications.

The on-screen CPU numbers and socket locations on the system board are associated as shown in the figure on the previous page.

To clear the CPU error information

Select [Main] - [Processor Settings] - [Processor Retest] - [Yes] and reboot the server.

Keyboard

To set Numlock

Select [Advanced] - [Numlock].

Security

To set passwords on the BIOS level

Select [Security] - [Set Administrator Password] and enter a password.

Set Administrator password first, then User password.

To enable/disable the POWER switch

Select [Security] - [Power Switch Inhibit] - [Enabled].

Select [Security] - [Power Switch Inhibit] - [Disabled].

> **IMPORTANT:** Masking the POWER switch disables forced shutdown (see Chapter 7) as well as power on/off using the POWER switch.

To set the secure mode

Select [Security] - [Set User Password] and enter the password.

Select [Security] - [Secure Mode] and set each item.

External Devices

To set up external devices

Select [Advanced] - [Peripheral Configuration] and set up each device.

Internal Devices

To set up internal PCI devices of the server

Select [Advanced] - [PCI Configuration] and set up each device.

To install the disk array controller

Select [Advanced] - [PCI Configuration] - [PCI Slot 1x ROM] - [Enabled].

x=C: Riser card of low-profile type

x=B: Riser card of full-length/full-height type

To clear the hardware configuration data (after installing/removing internal devices)

Select [Advanced] - [Reset Configuration Data] - [Yes].

Saving the Configuration Data

To save the BIOS configuration data

Select [Exit] - [Exit Saving Changes].

To discard changes to the BIOS configuration data

Select [Exit] - [Exit Discarding Changes] or [Discard Changes].

To resume the factory-set BIOS configuration data

Select [Exit] - [Load Setup Defaults].

To save the current settings as user-defined configuration

Select [Exit] - [Save Custom Defaults].

To load the user-defined configuration data

Select [Exit] - [Load Custom Defaults].

Menu and Parameter Descriptions

The SETUP utility has the following six major menus:

- Main
- Advanced
- Security
- Server
- Boot
- Exit

To set minute functions, select a submenu from the above menus. The following describes available functions and parameters, as well as the factory-set, for each menu.

Main

Start the SETUP utility to display the Main menu. The menu item preceded by "™" mark has its submenus. Select an option with the "™" mark and press **Enter** to display its submenu.

```
                              BIOS Setup Utility

   Main       Advanced      Security       Server       Boot          Exit


   System Time:              [16:45:51]
   System Date:              [Wed 10/19/2001]

   Floppy A:                 [1.44/1.25/1.2MB  3 1/2"]
   Hard Disk Pre-Delay:      [Disabled]

  ▶Primary IDE Master:       [MATSHITA CR-177]
  ▶Primary IDE Slave:        [Not Installed]
  ▶Processor Settings

   Language                  [English(US)]
                                                    +/-     Cycle Time Value
                                                    Enter  Select Time Field
                                                    ←→     Select Menu
                                                    ↑↓     Select Item
                                                    F9     Setup Defaults
                                                    F10    Save and Exit
                                                    ESC    Exit
```

Available options in the Main and descriptions are listed below.

Option	Parameter	Description	Your Setting
System Time	HH:MM:SS	Sets the system time.	
System Date	MM/DD/YYYY	Sets the system date.	
Floppy A:	Not Installed [1.44/1.25 MB/1.2 MB 3.5"] 2.88 MB 3.5"	Sets the floppy disk drive A (standard configuration).	
Hard Disk Pre-delay	[Disabled] 3 seconds 6 seconds 9 seconds 12 seconds 15 seconds 21 seconds 30 seconds	Causes the BIOS to insert a delay before attempting to detect IDE drives in the system during POST.	
Primary IDE Master/ Primary IDE Slave	–	Displays information on the device connected to the channel. Some items may be modified, however, use the factory-set values.	
Processor Settings	–	Displays information on processor (CPU) and menu window to setup.	
Language	[English (US)] Français Deutsch Italiano Español	Selects which language SETUP displays.	

[   ]: Factory-set

Processor Settings

Select "Processor Settings" on Main menu to display the following menu.

```
                              BIOS Setup Utility
    ┌────────┐
    │  Main  │
    └────────┘
    ┌─────────────────────────────────────────────────┬──────────────────────┐
    │ Processor Settings                               │ If "Enabled", BIOS   │
    │                                                  │ will activate and    │
    │  Processor Type:          Intel(R) Pentium(R) III│ retest all processors│
    │  Processor POST Speed:    x.xx GHz               │ on the next system   │
    │  Processor Retest:        [Disabled]             │ boot.                │
    │                                                  │ This option will be  │
    │  Processor 1 CPU ID:      6B1                     │ automatically reset  │
    │ ▶Processor 1 L2 Cache:    512KB ECC              │ to "Disable" on      │
    │ ▶Processor 2 CPU ID:      6B1                     │ the next system boot.│
    │ ▶Processor 2 L2 Cache:    512KB ECC              │ Default = [Disabled] │
    │                                                  │                      │
    │                                                  │                      │
    │                                                  │ ← →   Select Menu    │
    │                                                  │ ↑ ↓   Select Item    │
    │                                                  │ Enter Select > Sub-Menu│
    │                                                  │ F9    Setup Defaults │
    │                                                  │ F10   Save and Exit  │
    │                                                  │ ESC   Exit           │
    └─────────────────────────────────────────────────┴──────────────────────┘
```

See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Processor Type	–	Reports type of processor(s) installed in system. (View only)	
Processor POST Speed	–	Reports the speed of the processor measured at POST. (View only)	
Processor Retest	[Disabled] Enabled	Clears CPU error information and retests all processors on the next boot.	
Processor 1 CPU ID	Numeric (06xx)	Numeric indicates CPU 1 ID. Blank indicates that no processor is installed, or if installed, the processor failed. (View only)	
Processor 1 L2 Cache	–	Reports L2 Cache Size for Processor 1. (View only)	
Processor 2CPU ID	Numeric (06xx)	Numeric indicates CPU 2 ID. Blank indicates that no processor is installed, or if installed, the processor failed. (View only)	
Processor 2 L2 Cache	–	Reports L2 Cache Size for Processor 2. (View only)	

[   ]: Factory-set

Advanced

Move the cursor onto "Advanced" to display the Advanced menu. The menu item preceded by "™" mark has its submenus. Select an option with the "™" mark and press **Enter** to display its submenu.

```
                            BIOS Setup Utility
     Main      Advanced      Security       Server       Boot         Exit

     Setup Warning                                   Additional setup menus
     Setting items on this screen to incorrect values   to configure PCI
     may cause your system to malfunction!              devices.

     ▶PCI Configuration
     ▶Peripheral Configuration
     ▶Memory Configuration
     ▶Advanced Chipset Control
     Reset Config Data:          [No]
     Numlock:                    [Off]


                                                   ←→    Select Menu
                                                   ↑↓    Select Item
                                                   F9    Setup Defaults
                                                   F10   Save and Exit
                                                   ESC   Exit
```

See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Reset Config Data	[No] Yes	Select "Yes" to clear the configuration data (system information stored by POST). The parameter "No" will be resumed when the server restarts.	
Numlock	[Off] On	Enable or disable the Numlock function at system start-up. If "Auto" is selected, the Numlock function will be enabled when an entry with the keypad is detected.	

[ ]: Factory-set

IMPORTANT:

■ Boot Monitoring feature is not supported in this server.

■ If Reset Config Data is set to "Yes", boot device priority is also cleared. Take a note of boot device priority before changing the parameter. Restart the server with Exit Saving Changes option, start BIOS SETUP utility, and restore the boot device priority.

PCI Configuration

Select "PCI Configuration" on the Advanced menu to display the following screen. Select an option with the "™" mark and press **Enter** to display its submenu.

```
                          BIOS Setup Utility
              ┌──────────┐
              │ Advanced │
              └──────────┘

    PCI Configuration

      ▶USB Function
      ▶Onboard NIC 1
      ▶Onboard NIC 2
      ▶Onboard SCSI
      ▶Onboard Video

      PCI SLOT 1B ROM:          [Enabled]
      PCI SLOT 1C ROM:          [Enabled]


                                              ← →    Select Menu
                                              ↑ ↓    Select Item
                                              Enter  Select Sub-Menu
                                              F9     Setup Defaults
                                              F10    Save and Exit
                                              ESC    Exit
```
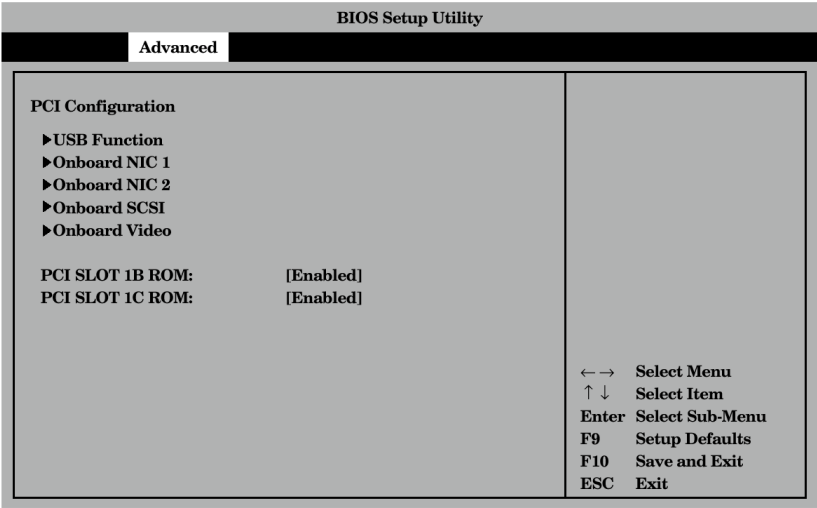
Option	Parameter	Description	Your Setting
PCI Slot 1B ROM*	[Enabled] Disabled	Used to enable or disable an option ROM that may be present on a PCI add-in card connected to the full-height riser card.	
PCI Slot 1C ROM*	[Enabled] Disabled	Used to enable or disable an option ROM that may be present on a PCI add-in card connected to the low-profile riser card.	

[ ]: Factory-set

NOTES:

- When the LAN controller does not provide network booting, set the option ROM for the LAN board to "Disabled".

- When connecting a hard disk containing OS to the disk array controller, set the slot of the disk array controller to "Enabled".

USB Function Submenu

Option	Parameter	Description	Your Setting
USB Function	[Enabled] Disabled	Enables or disables the onboard USB controller BIOS.	

[   ]: Factory-set

Onboard NIC 1 / Onboard NIC 2 Submenu

Option	Parameter	Description	Your Setting
Onboard NIC	[Enabled] Disabled	Enables or disables onboard LAN controller.	
Embedded NIC ROM	[Enabled] Disabled	Enables or disables onboard LAN controller expansion ROM.	

[   ]: Factory-set

Onboard SCSI Submenu

Option	Parameter	Description	Your Setting
Onboard SCSI	[Enabled] Disabled	Enables or disables onboard SCSI controller.	
Onboard SCSI ROM	[Enabled] Disabled	Enables or disables onboard SCSI controller expansion ROM.	

[   ]: Factory-set

Onboard Video Submenu

Option	Parameter	Description	Your Setting
Onboard Video	[Enabled] Disabled	Enables or disables onboard video controller.	

[   ]: Factory-set

Peripheral Configuration

Select "Peripheral Configuration" on the Advanced menu to display the following screen.

```
                          BIOS Setup Utility
          ┌─────────────┐
          │  Advanced   │
          └─────────────┘

   Peripheral Configuration                      Configure serial
                                                 port 1. If you use
   Serial Port 1 Address:      [3F8]             this COM port for
   Serial Port 1 irq:          [4]               console Redirection,
   Serial Port 2 Address:      [2F8]             make sure I/O & IRQ
   Serial Port 2 irq:          [3]               are identical to the
                                                 values in SERVER
   Diskette Controller:        [Enabled]         Setup menu.
   Legacy USB Support:         [Auto]
   Front Panel USB:            [Enabled]


                                                 ← →    Select Menu
                                                 ↑ ↓    Select Item
                                                 Enter  Select Sub-Menu
                                                 F9     Setup Defaults
                                                 F10    Save and Exit
                                                 ESC    Exit
```

Displayed only
when the user
password is set.
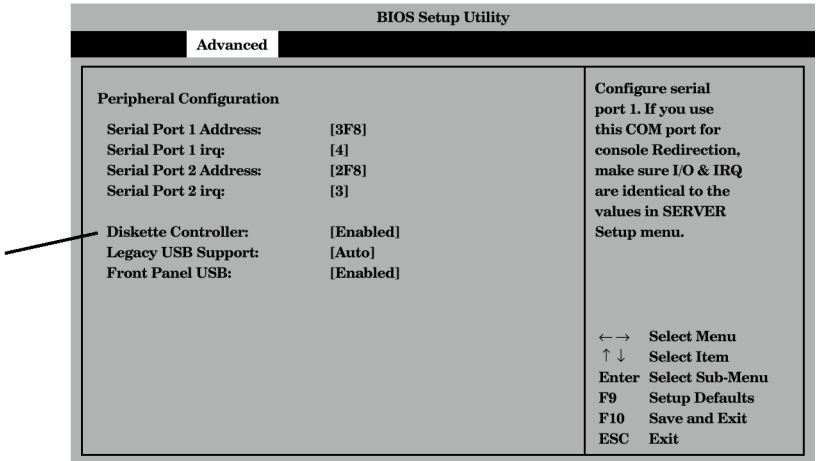
See the table below for setup options on the screen.

> **IMPORTANT:** Make sure to avoid any conflict in the interrupt requests or the base I/O addresses. If an assigned value is already used by another resource, it appears in yellow. Any yellow value must be re-assigned.

Option	Parameter	Description	Your Setting
Serial Port 1 Address	Disabled [3F8] 2F8 3E8 2E8	Used to configure the base I/O address for serial port 1.	
Serial Port 1 IRQ	[4] 3	Used to configure the interrupt for serial port 1.	
Serial Port 1 Address	Disabled 3F8 [2F8] 3E8 2E8	Used to configure the base I/O address for serial port 2.	
Serial Port 1 IRQ	4 [3]	Used to configure the interrupt for serial port 2.	
Diskette Write Protect	[Disabled] Enabled	Displayed only when the user password is set. Used to allow or inhibit writing into floppy disk.	
Diskette Controller	Enabled [Disabled]	Enables or disables onboard floppy disk controller BIOS.	
Legacy USB Support	[Disabled] Keyboard Only Auto Keyboard and Mouse	Disables or enables support for USB keyboards and mice. Always set to "Disabled" with this server.	
Front Panel USB	Disabled [Enabled]	Enables or disables the USB port on the front panel.	

[ ]: Factory-set

Memory Configuration

Select "Memory Configuration" on the Advanced menu to display the following screen.

```
                              BIOS Setup Utility
          Advanced

  Memory Configuration

    Extended Memory Test:        [Disabled]


    BANK #1:                     [Installed]
    BANK #2:                     [Installed]
    BANK #3:                     [Not Installed]

    Memory Test:                 [Disabled]




                                              ← →    Select Menu
                                              ↑ ↓    Select Item
                                              Enter  Select Sub-Menu
                                              F9     Setup Defaults
                                              F10    Save and Exit
                                              ESC    Exit
```
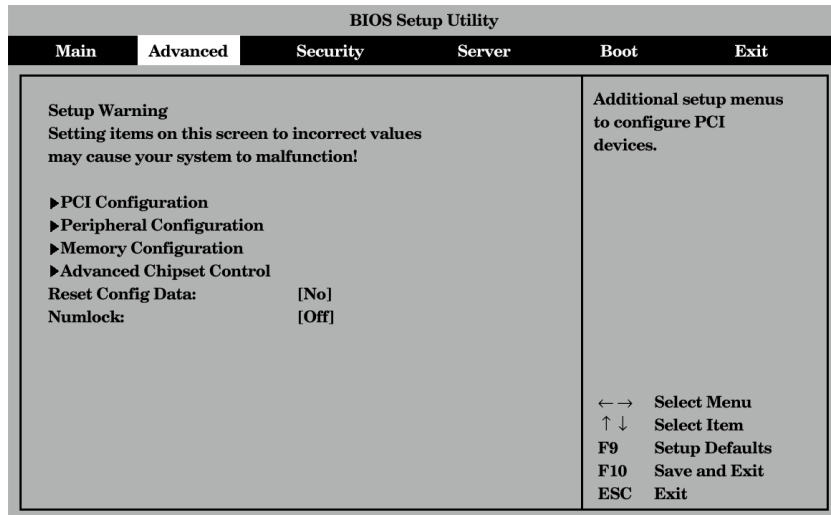
See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Extended Memory Test	1 MB 1 KB Every-Location [Disabled]	Extended memory test options run during POST. 1MB: Tests every 1-MB memory. 1KB: Tests every 1-KB memory. Every-Location: Tests every memory location. Disabled: Initializes memory. Note: the smaller the test unit, the longer the test takes during POST.	
DIMM Bank #1 - #3	Installed Disabled Not Installed	Indicates the current memory status. "Normal" indicates the normal status, "Error" indicates a memory error, and "None" indicates no DIMM installed (view only). Bank #1 indicates DIMMs in DIMM socket #1A and #1B. Bank #2 indicates DIMMs in DIMM Bank #2A and #2B. Bank #3 indicates DIMMs in DIMM Bank #3A and #3B. (Memory is interleaved and two DIMMs are used in pair.)	
Memory Retest	[Disabled] Enabled	Clears memory error information and retests all DIMMs on the next system boot. This option will be automatically reset to [Disabled] on the next system boot.	

[　]: Factory-set

Advanced Chipset Control

Select "Advanced Chipset Control" on Advanced menu to display the following screen. Select an option and press **Enter** to display its submenu.

```
                          BIOS Setup Utility
        Advanced

  Advanced Chipset Controll                          Legacy Wake only
                                                     Determines the action
    Wake On Ring:              [Disabled]            of the system when the
    Wake On LAN:              [Disabled]             system power is off
    Wake On PME:              [Disabled]             and the modem is
    Wake On RTC Alarm:       [Disabled]              ringing.




                                                  ← →   Select Menu
                                                  ↑ ↓   Select Item
                                                  Enter Select Sub-Menu
                                                  F9    Setup Defaults
                                                  F10   Save and Exit
                                                  ESC   Exit
```

See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Wake on Ring	[Disabled] Enabled	Enables or disables the remote power-on features via serial port (modem).	
Wake on LAN	[Disabled] Enabled	Enables or disables the remote power-on features via network.	
Wake on PME	[Disabled] Enabled	Enables or disables the remote power-on features by PCI device (PCI Power Management Enable wake up event).	
Wake on RTC Alarm	[Disabled] Enabled	Enables or disables the remote power-on features using RTC Alarm features.	

[   ]: Factory-set

Security

Move the cursor onto "Security" to display the Security menu.

```
                              BIOS Setup Utility
    Main       Advanced      Security      Server      Boot        Exit

    User Password is:            [Installed]          Administrator Password
    Administrator Password is:   [Installed]          controles access to the
    ▶Set Admin Password                               setup utility.
    ▶Set User Password
    User Access Level:           [Limited]
    Password On Boot:            [Disabled]
    Scure Mode Timer:            [1 Minute]
    Security Hot Key CTRL-ALT-:  [L]
    Secure Mode Boot:            [Disabled]
    Video Blanking:              [Disabled]
    Power Switch Inhibit:        [Disabled]

                                                      ←→    Select Menu
                                                      ↑↓    Select Item
                                                      Enter Select Sub-Menu
                                                      F9    Setup Defaults
                                                      F10   Save and Exit
                                                      ESC   Exit
```

Selectable only when the User password is set.

Select "Set Administrator Password" or "Set User Password" and press **Enter** to display the following pop-up screen.

The screen below shows when "Set Administrator Password" is selected.

Set a password on this pop-up screen. Enter a password of up to seven alphanumeric characters and symbols from the keyboard.

```
                              BIOS Setup Utility
    Main       Advanced      Security      Server      Boot        Exit

    User Password is:            [Installed]          Administrator Password
    Administrator Password is:   [Installed]          controles access to the
    ▶Set Admin Password                               setup utility.
    ▶Set User Password
    User Access Level:           [Limited]
    Password On Boot:            [Disabled]
    Scure Mode Timer:
    Security Hot Key CT  Enter Password: [          ]
    Secure Mode Boot:
    Video Blanking:              [Disabled]
    Power Switch Inhibit:        [Disabled]

                                                      ←→    Select Menu
                                                      ↑↓    Select Item
                                                      Enter Select Sub-Menu
                                                      F9    Setup Defaults
                                                      F10   Save and Exit
                                                      ESC   Exit
```

IMPORTANT:

- User password setup is not available before Administrator password setup.
- Do not set any password before installing the OS.
- If you forget any password, consult with your sales representative.
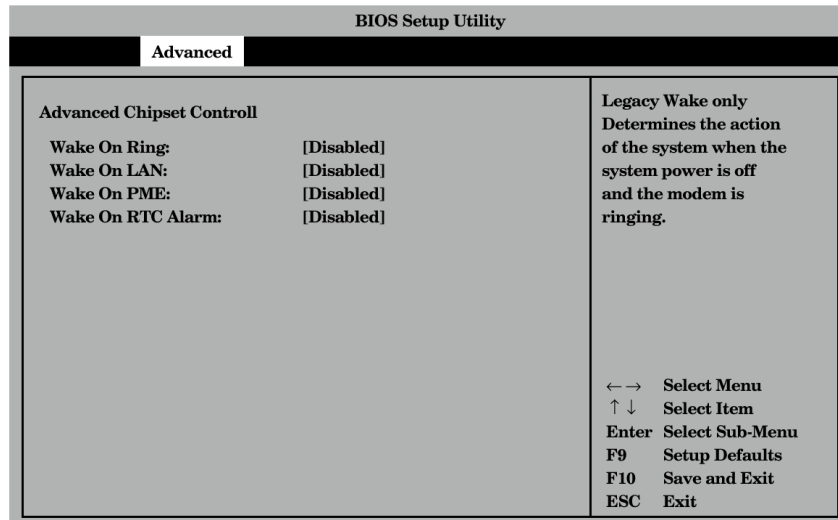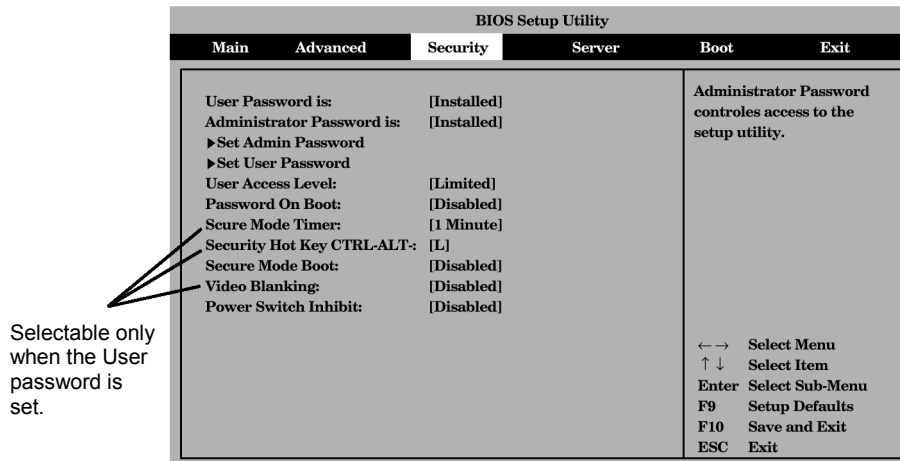
See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
User Password is	Installed Not Installed	Indicates whether the user password is set or not (view only).	
Administrator Password is	Installed Not Installed	Indicates whether the administrator password is set or not (view only).	
Set Administrator Password	Up to 7 alphanumeric characters	Press **Enter** to display the administrator password entry screen. With the administrator password, all SETUP menus are available for access. This option is available only when you log into the SETUP utility with the administrator password.	
Set User Password	Up to 7 alphanumeric characters	Press **Enter** to display the user password entry screen. With a user password, accessible SETUP menus are restricted. This option is available only if the Administrator Password is specified.	
User Access Level	Limited No Access View Only Full	Sets the User access level when logged in with user password. When set to "Full", the system does not enter secure mode.	
Password On Boot	[Disabled] Enabled	Specify whether to request a password entry at boot-up. Administrator password setup is required beforehand. When the administrator password is specified and this option is disabled, the BIOS assumes that a system boot attempt is made by a user.	
Secure Mode Timer	[1 minute] 2 minutes 5 minutes 10 minutes 20 minutes 60 minutes 120 minutes	Set the period from no input from the keyboard or mouse to the point at which the system enters into the secure mode. If this item is set to "Disabled," the system does not enter the secure mode.	
Security Hot Key CTRL-ALT-	[L] Z	Specify the hot key to invoke secure mode features. Pressing the assigned key along with **Ctrl** and **Alt** invoke secure mode. This option is enabled when User Password is set.	
Secure Mode Boot	[Disabled] Enabled	Specify whether the system boots in secure mode. This option is enabled when User Password is set.	
Video Blanking	[Disabled] Enabled	Specify whether to turn off the monitor when secure mode is activated.	
Power Switch Inhibit	[Disabled] Enabled	Enables or disables the POWER switch. If "Enabled" is selected, power-off with the POWER switch becomes unavailable after OS boot-up. (Forced shut down also becomes unavailable. Forced shut down is a feature to shut down by pressing the POWER switch for at least four seconds.)	

[   ]: Factory-set

Server

Move the cursor onto "Server" to display the Server menu.

```
                            BIOS Setup Utility
    Main      Advanced      Security      Server      Boot      Exit

    ▶System Management
    ▶Console Redirection
    ▶Event Log Configuration

    Service Boot:              [Disabled]
    Assert NMI on PERR:        [Disabled]
    Assert NMI on SERR:        [Enabled]
    BMC IRQ:                   [IRQ 11]
    After Power Failure:       [Last State]
    Temperature Sensor:        [Disabled]
    POST Error Pause:          [Enabled]
    Platform Event Filtering:  [Disabled]
                                                ←→    Select Menu
                                                ↑↓    Select Item
                                                Enter Select Sub-Menu
                                                F9    Setup Defaults
                                                F10   Save and Exit
                                                ESC   Exit
```

The table below lists options that you can specify on the Server menu screen and their functions. To make a selection for "System Management", "Console Redirection", and "Event Log Configuration", first select a desired option and press **Enter** to display its submenu.
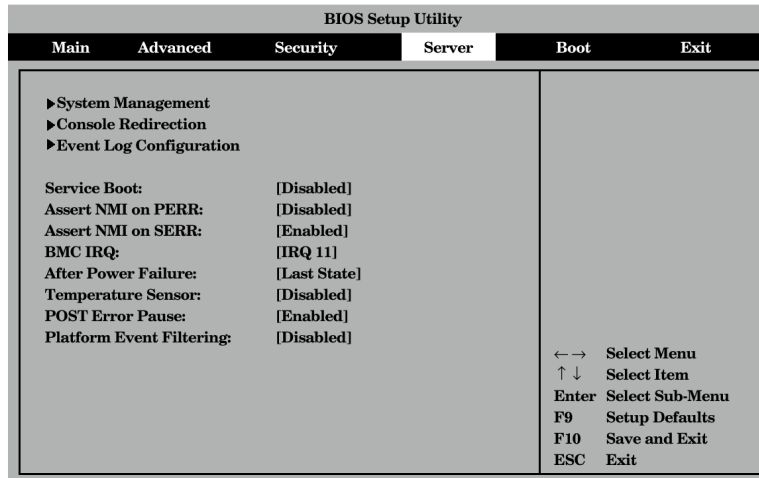
See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Service Boot	Enabled [Disabled]	Specifies whether to boot directly to System Management menu at system start-up.	
Assert NMI on PERR	[Disabled] Enabled	Sets support of PCI PERR.	
Assert NMI on SERR	Disabled [Enabled]	Sets support of PCI SERR.	
BMC IRQ	Disabled IRQ 5 [IRQ 11]	Sets the BMC IRQ.	
After Power Failure	Stays Off [Last State] Power On	Sets the AC-LINK feature. Determines the mode of operation if a power loss occurs. (See the table below.)	
Temperature Sensor	[Disabled] Enabled	Enables or disables temperature sensor monitoring feature.	
POST Error Pause	Disabled [Enabled]	Specifies whether the system waits for user intervention on critical POST errors or not.	
Platform Event Filtering	[Disabled]	Enables or disables triggers for system sensor events inside the Baseboard Management Controller (BMC).	

[ ]: Factory-set

The table below lists how selections for "After Power Failure" determine the power status of the server when the power supply to the server restarts.

State before powered off	Parameter		
	Stays Off	Last State	Power On
In service	Off	On	On
Out of service (DC power: Off)	Off	Off	On
Forced shutdown *	Off	Off	On

    *   Pressing the POWER switch for at least four seconds shuts down the power to the server.

System Management Submenu

Select "System Management" on the Server menu and press **Enter** to display the following screen.

```
                          BIOS Setup Utility
                                    Server

    System Management

      Board Part Number:          [FR1.0]
      Board Serial Number:        [KKC213300010]
      System Part Number:         [AA]
      System Serial Number:       [1234567890]
      Chassis Part Number:        [SR2200]
      Chassis Serial Number:      [01]
      BIOS Version:               SCB20.86B.011.D9
      BMC Revision:               [xxxxxxxxxxxxxxxx]
      HSBP Revision:              [N/A]


                                           ←→    Select Menu
                                           ↑↓    Select Item
                                           Enter Select Sub-Menu
                                           F9    Setup Defaults
                                           F10   Save and Exit
                                           ESC   Exit
```

See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Board Part Number	–	Indicates the part number of system board. (View only)	
Board Serial Number	–	Indicates the serial number of system board. (View only)	
System Part Number	–	Indicates the system part number. (View only)	
System Serial Number	–	Indicates the serial number of system. (View only)	
Chassis Part Number	–	Indicates the part number of chassis. (View only)	
Chassis Serial Number	–	Indicates the serial number of chassis. (View only)	
BIOS Revision	–	Indicates BIOS revision number. (View only)	
BMC Revision	–	Indicates BMC (Baseboard Management Controller) revision number. (View only)	
HSBP Revision	–	Indicates HSBP (Hot-Swap BackPlane) revision number. (View only)	

[   ]: Factory-set

Console Redirection

Select "Console Redirection" on the Server menu and press **Enter** to display the following screen.

```
                        BIOS Setup Utility
                    ┌─────────────────────┐
                    │       Server        │
                    └─────────────────────┘

   Console Redirection                          If enabled, BIOS uses
                                                the specified serial
     Serial Console Redirection:  [Disabled]    port to redirect the
     Serial Port:                 [COM1 3F8 IRQ 4]  console to a remote
     Baud Rate:                   [19.2K]       ANSI terminal.
     Flow Controle:               [CTS/RTS]     Enabling this option
                                                disables Quiet Boot.




                                                ← →    Select Menu
                                                ↑ ↓    Select Item
                                                Enter  Select Sub-Menu
                                                F9     Setup Defaults
                                                F10    Save and Exit
                                                ESC    Exit
```

See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Serial Console Redirection	[Disabled] Enabled	Specifies whether BIOS uses the specified serial port to redirect the console to MWA or a remote terminal using hyper terminal. Disable the Quiet Boot option in BOOT menu.	
Serial Port	COM1 3F8 IRQ4 COM2 2F8 IRQ3	Selects an address/interrupt for the serial port used for redirection. Make sure to use the same address/interrupt as specified in [Advanced] - [Peripheral Configuration].	
Baud Rate	9600 [19.2k] 38.4k 115.2k	Selects a baud rate for communications with the connected HW console. [56k] is not available.	
Flow Control	No Flow Control [CTS/RTS] XON/XOFF CTS/RTS+CD	Select a flow control method.	

[ ]: Factory-set

Event Log Configuration Submenu

Select "Event Log Configuration" on the Server menu and press **Enter** to display the following screen.

See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Clear All Event Logs	[No] Yes	Clears the DMI event log after a system reboot.	
Event Logging	[Enabled] Disabled	Specifies whether all systems events are logged or not.	
Critical Event Logging	[Enabled] Disabled	Specifies whether to detect and log event at system critical errors. Critical errors are fatal to system operation. These errors include PERR, SERR, ECC, Memory errors and NMI.	

[ ]: Factory-set

Boot

Move the cursor onto "Boot" to display the Boot menu. Available options in the Boot menu and descriptions are described below. To make a selection for "Boot Device Priority", "Hard Drive", "Removable Devices", and "ATAPI CDROM Drives", first select a desired option and press **Enter** to display its submenu.

```
                          BIOS Setup Utility
    Main      Advanced      Security      Server      Boot      Exit

                                                   Disabled, displays
    Quiet Boot:            [Enabled]              normal POST messages.
                                                   Enabled, displays OEM
   ▶Boot Devie Priority                           Logo instead of POST
   ▶Hard disk Drives                              messages.
   ▶Removable Devices                             Enabling this option
   ▶ATAPI CDROM Drives                            disables Serial
                                                   Redirection.



                                                   ←→   Select Menu
                                                   ↑↓   Select Item
                                                   Enter  Select Sub-Menu
                                                   F9     Setup Defaults
                                                   F10    Save and Exit
                                                   ESC    Exit
```
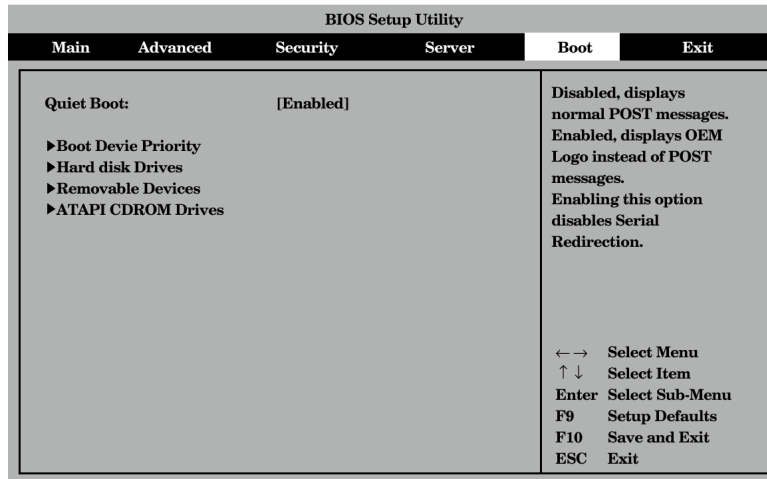
See the table below for setup options on the screen.

Option	Parameter	Description	Your Setting
Quiet Boot	Disabled [Enabled]	If disabled, displays normal POST messages. If enabled, displays NEC Logo instead of POST messages. Enabling this option disables console redirection.	

[ ]: Factory-set

Boot Device Priority

The system searches for the boot device according to the order specified in this menu and use the software to boot the system if found.

Move the cursor to select the device by ↑ or ↓, and then change the priority using + or –.

> **IMPORTANT:**
>
> ■ To start the EXPRESSBUILDER, specify "ATAPI CD-ROM Drive" to 1st Boot Device, and "Removable Devices" to 2nd Boot Device.
>
> ■ LAN port 1 and LAN port 2 are displayed with the same name. LAN port 1 is determined according to priority after [Load Setup Defaults] is executed or factory-set (4th Boot Device).
>
> ■ For LAN device that does not boot with PXE, specify "Disabled" for [Advanced] - [PCI Configuration] - [Onboard NIC 1], [Onboard NIC 2], and PCI slot containing optional LAN board.

Option	Parameter	Description	Your Setting
1st Boot Device	Removable Devices	Attempts to boot from a removable media device.	
2nd Boot Device	ATAPI CD-ROM Drive	Attempts to boot from an ATAPI CD-ROM drive.	
3rd Boot Device	Hard Drive	Attempts to boot from a hard drive device.	
4th Boot Device	Intel Boot Agent ver	Attempts to boot from a network (PXE boot).	
5thBoot Device	Intel Boot Agent ver	Attempts to boot from a network (PXE boot).	

Hard Disk Submenu

Set the boot priority of hard disks being connected to the server. The system searches for the boot device according to the order specified in this submenu and use the software to boot the system if found.

Move the cursor to select the device by ↑ or ↓, and then change the priority using + or –.

Item	Description
1. Drive #1 (or actual drive name)	"Other bootable cards" cover all the boot devices not reported to the system BIOS through BIOS Boot Specification mechanisms. It may or may not be bootable, and may not correspond to any device.
2. Other bootable cards	

Removable Devices Submenu

Select the removable device used to boot the system. The system searches for the boot device according to the order specified in this submenu and use the software to boot the system if found.

Move the cursor to select the device by ↑ or ↓.

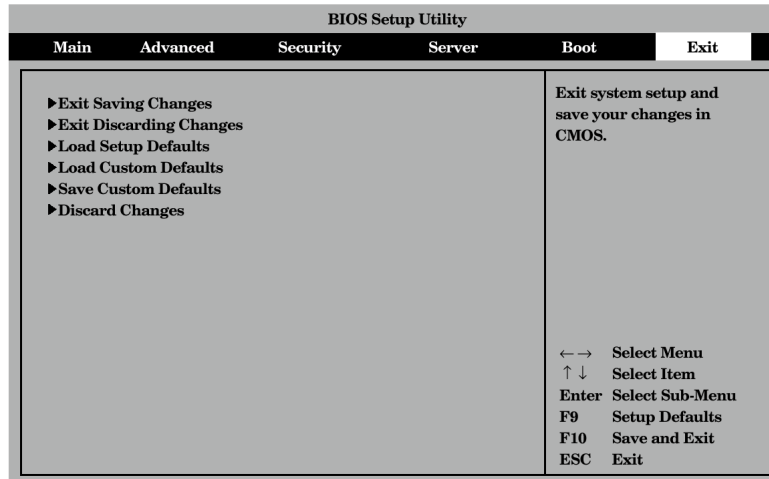| Item	Description
Lists Bootable Removable devices in the system.	Select one of the detected devices. This list includes legacy 1.44-MB floppy drives and 120-MB floppy drives.

ATAPI CD-ROM Drives Submenu

Select the CD-ROM drive used to boot the system. The system searches for the boot device according to the order specified in this submenu and use the software to boot the system if found.

Move the cursor to select the device by ↑ or ↓.

Item	Description
Lists Bootable Removable devices in the system.	Select one of the detected devices. This includes any ATAPI CD-ROM Drive installed.

Exit

Move the cursor onto "Exit" to display the Exit menu.

```
                            BIOS Setup Utility
   Main      Advanced      Security      Server      Boot      Exit

 ▶Exit Saving Changes                              Exit system setup and
 ▶Exit Discarding Changes                          save your changes in
 ▶Load Setup Defaults                              CMOS.
 ▶Load Custom Defaults
 ▶Save Custom Defaults
 ▶Discard Changes




                                                   ←→    Select Menu
                                                   ↑↓    Select Item
                                                   Enter Select Sub-Menu
                                                   F9    Setup Defaults
                                                   F10   Save and Exit
                                                   ESC   Exit
```

The following describes each option on the Exit menu:

- Exit Saving Changes

  Select this option to save the current configuration data into the CMOS (non-volatile memory) and exit the SETUP utility.

  Select "Yes" to save the current configuration data into the CMOS (non-volatile memory) and exit the SETUP utility. The server will automatically restart the system.

- Exit Discarding Changes

  Select this option to discard the current configuration data and exit the SETUP utility.

  Select "Yes" to discard the current configuration data and exit the SETUP utility, and restart the server automatically. Select "No" to return to Exit menu.

- Load Setup Defaults

  Select this option to resume all default values (BIOS default values) of the SETUP utility.

  Select "Yes" to resume default values. Select "No" to return to the Exit menu screen. If you resumed the default values, you need to change settings as described below to operate the system normally.

  - [Advanced] - [Peripheral Configuration] - [Legacy USB Support] - [Disabled]
  - [Boot] - [Boot Device Priority] - [ATPI CD-ROM Drive] - [1st Boot Device]
  - [Boot] - [Boot Device Priority] - [Removable Drive] - [2nd Boot Device]
  - [Boot] - [Hard Disk] and set the boot priority.

■ Load Custom Defaults

Select this option and press **Enter** to load the custom defaults saved from previous Save Custom Defaults.

■ Save Custom Defaults

Select this option and press **Enter** to save the current configuration data as custom defaults. When the configuration is saved, the Load Custom Defaults menu appears.

■ Discard Changes

Select this option to discard any changes made to BIOS settings and restore the previous settings.

Select "Yes" to discard the current settings.

SCSI BIOS ~ SCSI*Select* ~

The SCSI*Select* utility is provided to configure the SCSI controller on the system board (or the SCSI controller on an optional board). This utility may be started with a simple key operation while POST is in progress and requires no specific start-up disk.

Using SCSI*Select* Utility

Use the SCSI*Select* utility mainly to set the transfer speed of connected SCSI devices. The SCSI devices include those installed in the 5.25-inch device bays and backup devices, such as an external DAT and MO, but not hard disks.

> **IMPORTANT:** SCSI configuration must be made on a per-SCSI controller basis with a utility. The server contains one SCSI controller.
> When you added optional SCSI controllers, you need to make configuration for each SCSI controller in addition to the standard internal SCSI controller. Some additional SCSI controllers may require a different utility to make changes to the configuration.

Configuring SCSI Controller on System Board

The following describes configuration for the SCSI controller on the system board of the server.

> **IMPORTANT:** The server contains the latest version of the SCSI*Select* utility. Dialog boxes appear on your SETUP utility, thus, may differ from descriptions in this User's Guide. If you find anything unclear, see the online help or ask your sales representative.

Procedure from Start-up to Exit

The following describes the procedure from starting to exiting the SCSI*Select* utility. For parameter descriptions, see the section "Parameters" described later.

1. Power on the Express server.

The following message appears while POST is in progress.

> **IMPORTANT:** The message appears for each additional SCSI controller.

```
Adaptec AIC-7899 SCSI BIOS V 2.55
(c) 1999 Adaptec, Inc. All Rights Reserved

◀ ◀ ◀ Press <Ctrl> <A> for SCSISelect(TM) Utility!  ▶ ▶ ▶
```

2. Press and hold **Ctrl** and **A**.

The SCSI*Select* utility starts and its Main menu appears.

3. Select "01:06:A" or "01:06:B" in the "Bus:Device" box with the cursor keys and press **Enter**.

```
You have an AIC-7899                       ┌─ Bus:Device:Channel ─┐
SCSI host adapter in your system. Move             01:06:A
the cursor to the bus:device:channel of            01:06:B
the one to be configured and
press <Enter>.

<F5>  -  Toggle color/monochrome
```

The system board is provided with two SCSI controller channels. Channel B (01:06:B) indicates the Ultra-160/m SCSI connector (for hard disks); and Channel A (01:06:A) indicates the Wide Ultra 2 SCSI connector (for 5.25-inch devices and external SCSI devices).

Select the device number in the "Bus:Device" box and press **Enter**.

The Options menu appears.

4. Select "Configure/View Host Adapter Settings" and press **Enter**.

```
            ─── Options ───
  Configure/View Host Adapter Settings
          SCSI Disk Utilities
```

The Configuration menu appears.

```
┌─ Configuration ──────────────────────────────────────────────┐
│  SCSI Bus Interface Definitions                               │
│  Host Adapter SCSI ID ................................   7     │
│  SCSI Parity Checking.................................   Enabled │
│  Host Adapter SCSI Termination .......................   Enabled │
│                                                               │
│  Additional Options                                           │
│  Boot Device Options..................................   Press<Enter> │
│  SCSI Device Configuration ...........................   Press<Enter> │
│  Advanced Configuration Options.......................   Press<Enter> │
│                                                               │
│  <F6> - Reset to Host Adapter Defaults                        │
│                                                               │
└───────────────────────────────────────────────────────────────┘
```

5. Select a parameter for each menu item.

See the section "Parameters" described later to set an appropriate parameter for each menu item.

6. After completing the parameter settings, press **Esc** repeatedly until the following save message appears.

```
┌─────────────────────────────────────────┐
│  Save Changes Made?                     │
└─────────────────────────────────────────┘
```

7. If the configuration data is correct, select "Yes" and press **Enter**.

8. Press **Esc** repeatedly until the following exit message appears.

```
┌─────────────────────────────────────────┐
│  Exit Utility?                          │
└─────────────────────────────────────────┘
```

9. Select "Yes" and press **Enter** to exit.

Parameters

The SCSI*Select* utility to configure the internal SCSI controller of the server has the following menu items and parameters. Read descriptions to select a correct parameter for each menu item. For configuration of optional SCSI controllers and connected SCSI devices, see the section "Configuring SCSI Controller on Optional Board" described later.

SCSI Bus Interface Definitions

To set three menu items under "SCSI Bus Interface Definitions", select a menu item with the cursor keys (↓ or ↑) and press **Enter** to fix the item. Use the cursor keys (↓ or ↑) for parameter selection. The following table lists menu items, available parameters, and descriptions.

Menu item	Parameter	Description
Host Adapter SCSI ID	0 - [7] - 15	Select "7".
SCSI Parity Checking	[Enabled] Disabled	Select "Enabled".
Host Adapter SCSI Termination	[Enabled] Disabled	Enable or disable the SCSI termination. Select "Enabled".

[   ]: Factory-set

Additional Options

To set three menu items under "Additional Options", select a menu item with the cursor keys (↓ or ↑) and press **Enter** to display its submenu. Then, select a submenu item with the cursor keys (↓ or ↑) and press **Enter** to fix the item. Use the cursor keys (↓ or ↑) for parameter selection.

■ Boot Device Options

Move the cursor onto "Boot Device Options" and press **Enter** to display the following submenu.

```
┌──────────────── Boot Device Configuration ────────────────┐
│  Select SCSI peripheral from which to boot.                │
│  To view peripheral by ID# select "SCSI Disk Utilities" from previous menu. │
│                                                            │
│  Boot Channel.....................................................    A First │
│  Boot SCSI ID.....................................................    0      │
│                                                            │
│ ─── Options Listed Below Have NO EFFECT if MULTI LUN Support Is Disabled ─── │
│  Boot LUN Number.................................................    0       │
└────────────────────────────────────────────────────────────┘
```

The following table lists submenu items, available parameters, and descriptions.

Submenu item	Parameter	Description
Boot Channel	[A First] B First	Select "A First".
Boot SCSI ID	[0] - 15	Select "0".
Boot LUN Number	[0] - 7	Select "0".

[   ]: Factory-set

■ SCSI Device Configuration

Move the cursor onto "SCSI Device Configuration" and press **Enter** to display the following submenu.

```
┌──────────────── SCSI Device Configuration ─────────────────────┐
│                                                                 │
│   SCSI Device ID                      #0   #1   #2   #3   #4   #5   #6   #7
│   Sync Transfer Rate (MB/Sec)  ------- 160  160  160  160  160  160  160  160
│   Initiate Wide Negotiation    ------- Yes  Yes  Yes  Yes  Yes  Yes  Yes  Yes
│   Enable Disconnection         ------- Yes  Yes  Yes  Yes  Yes  Yes  Yes  Yes
│   Send Start Unit Command      ------- Yes  Yes  Yes  Yes  Yes  Yes  Yes  Yes
│
│   ──── Options Listed Below Have NO EFFECT if the BIOS is Disabled ────
│   Enable Write Back Cache      ------- N/C  N/C  N/C  N/C  N/C  N/C  N/C  N/C
│   BIOS Multiple LUN Support    ------- No   No   No   No   No   No   No   No
│   Include in BIOS Scan         ------- Yes  Yes  Yes  Yes  Yes  Yes  Yes  Yes
│
│   SCSI Device ID                      #8   #9   #10  #11  #12  #13  #14  #15
│   Sync Transfer Rate (MB/Sec)  ------- 160  160  160  160  160  160  160  160
│   Initiate Wide Negotiation    ------- Yes  Yes  Yes  Yes  Yes  Yes  Yes  Yes
│   Enable Disconnection         ------- Yes  Yes  Yes  Yes  Yes  Yes  Yes  Yes
│   Send Start Unit Command      ------- Yes  Yes  Yes  Yes  Yes  Yes  Yes  Yes
│
│   ──── Options Listed Below Have NO EFFECT if the BIOS is Disabled ────
│   Enable Write Back Cache      ------- N/C  N/C  N/C  N/C  N/C  N/C  N/C  N/C
│   BIOS Multiple LUN Support    ------- No   No   No   No   No   No   No   No
│   Include in BIOS Scan         ------- Yes  Yes  Yes  Yes  Yes  Yes  Yes  Yes
└─────────────────────────────────────────────────────────────────┘
```

The following table lists submenu items, available parameters, and descriptions.

IMPORTANT: Select a parameter for each submenu item on a per-SCSI ID basis. Verify the SCSI ID of a desired device before configuration.

NOTE: To find out the SCSI ID for the optional device connected, select "SCSI Disk Utilities" on the Options menu and press **Enter**. The SCSI ID scan begins displaying the message as shown below.

Scanning SCSI ID : 0   LUN Number : 0

When the SCSI ID scan completes, the screen listing SCSI IDs and associated devices appears.

```
             ── Select SCSI Disk and press <Enter> ──

     SCSI ID #0    :   No device
     SCSI ID #1    :   No device
     SCSI ID #2    :   No device
     SCSI ID #3    :   No device
     SCSI ID #4    :   No device
     SCSI ID #5    :   No device
     SCSI ID #6    :   No device
     SCSI ID #7    :   AIC-7899
     SCSI ID #8    :   No device
     SCSI ID #9    :   No device
     SCSI ID #10  :   No device
     SCSI ID #11  :   No device
     SCSI ID #12  :   No device
     SCSI ID #13  :   No device
     SCSI ID #14  :   No device
     SCSI ID #15  :   No device
```

Find out the SCSI ID for the installed optional on this screen. You can also view the device information by selecting a device and pressing **Enter**.

Submenu item	Parameter		Description
Sync Transfer Rate (MB/Sec)	[160] 80.0 53.4 40.0 32.0 26.8	20.0 16.0 13.4 10.0 ASYN	Select [160] as a recommended. You may need to change the value depending on your optional device. Refer to the manual that comes with your optional device.
Initiate Wide Negotiation	[Yes] No		Select "Yes" if your SCSI device supports the Wide SCSI interface. Select "No" if not.
Enable Disconnection	[Yes] No		Select "Yes".
Send Start Unit Command	[Yes] No		Select "Yes" to send the command to the hard disk. Otherwise select "No".
Enable Write Back Cache	Yes No [N/C]		Select "N/C".
BIOS Multiple LUN Support	Yes [No]		Select "No".
Include in BIOS Scan	[Yes] No		Select "Yes".

[   ]: Factory-set

■ Advanced Configuration Options

Move the cursor onto "Advanced Configuration Options" and press **Enter** to display the following submenu.

```
════════ Advanced Configuration Options ════════
Reset SCSI Bus at IC Initialization.................................................... Enabled
Display <Ctrl><A> Message During BIOS Initialization ................................. Enabled
Extended BIOS Translation for DOS Driver > 1 GByte .................................. Enabled
Verbose/Silent Mode...................................................................... Verbose

        ──── Options Listed Below Have NO EFFECT if MULTI LUN Support Is  ────
              Disabled
Host Adapter BIOS ........................................................................ Enabled
Domain Validation ........................................................................ Enabled
Support Removable Disks Under BIOS as Fixed Disks .................................. Disabled
BIOS Support for Bootable CD-ROM.................................................... Enabled
BIOS Support for Int13 Extensions.................................................... Enabled
```

The following table lists submenu items, available parameter, and descriptions.

Submenu item	Parameter	Description
Reset SCSI Bus at IC Initialization	[Enabled] Disabled	Select "Enabled".
Display <Ctrl><A> Message During BIOS Initialization	[Enabled] Disabled	Select "Enabled".
Extended BIOS Translation for DOS Driver > 1 GByte	[Enabled] Disabled	Select "Enabled".
Verbose/Silent Mode	[Verbose] Silent	Select "Verbose".
Host Adapter BIOS	[Enabled] Disabled: NOT Scan Disabled: scan bus	Enable or disable SCSI BIOS. Select "Enabled" for most cases other than the following: • To boot the OS from a hard disk connected to an optional SCSI controller. (If the optional SCSI controller has no hard disks connected, however, select "Enabled".) • BIOS the SCSI controller may be disabled to reserve an area in the expansion ROM space if the controller has no hard disks connected.
Domain Validation	[Enabled] Disabled: NOT Scan Disabled: scan bus	Enable or disable SCSI BIOS. Select "Enabled".
Support Removable Disks under BIOS as Fixed Disks	[Boot Only] All Disks [Disabled]	Select "Boot Only" if "01:06:A" is selected for "Bus:Device:Channel". Select "Disabled" if "01:06:B" is selected. When the default configuration is resumed, "Boot Only" is selected for both channels. In such a case, change the parameter for "01:06:B" to "Disabled".
BIOS Support for Bootable CD-ROM	[Enabled] Disabled	Select "Enabled".
BIOS Support for Int 13 Extension	[Enabled] Disabled	Select "Enabled".

[   ]: Factory-set

Configuring SCSI Controller on Optional Board

To configure SCSI devices connected to an optional SCSI controller board, use the SCSI BIOS utility provided with the optional SCSI controller board.

Refer to the manual that comes with the optional SCSI controller board for details.

When the server has multiple SCSI controller boards installed, the server first displays the start-up message of the SCSI*Select* utility for the SCSI controller on the system board. It then displays the utility start-up message for additional SCSI controllers one by one. The start-up message appears in order of the PCI board slot numbers of the riser card for low-profile type and the riser card for full-height type. The message displayed may vary depending on the optional SCSI controller board. Refer to the manual that comes with the optional SCSI controller board for details.

CONFIGURING SYSTEM BOARD JUMPERS

With the pre-installed SETUP utility, you can set desired passwords to protect the data stored in the server against access from unauthorized users. When you forget the passwords, however, you may want clear them. The following describes how to clear these passwords. You can also use the following procedure to clear the CMOS data in the server.

> **IMPORTANT:** Clearing the CMOS data resumes the factory-set configuration data. After clearing the CMOS contents, change the setting as shown below. This setting is necessary for operating the server correctly.
>
> - Select [Advanced] → [Peripheral Configuration] → [Legacy USB Support] → [Disabled].
> - Select [Boot] → [Boot Device Priority] → [ATAPI CD-ROM Drive] → [1st Boot Device].
> - Select [Boot] → [Boot Device Priority] → [Removable Drive] → [2nd Boot Device].
> - Select [Boot] → [Hard Disk], and set the boot order.

To clear passwords or the CMOS data, use the jumper switch on the system board of the server. The following figure illustrates the jumper switch location.

> **IMPORTANT:** Do not change any other switch settings. Any change may cause the server to fail or malfunction.

▢■▢ : Strapped

BMC WP CMOS Clear PSWD Clear Recovery Boot

PSWD Clear: Pin for protecting/clearing the password
CMOS Clear: Pin for protecting/clearing the CMOS contents (The figure shows the factory-set.)

Clears the password.
Clears the CMOS contents.
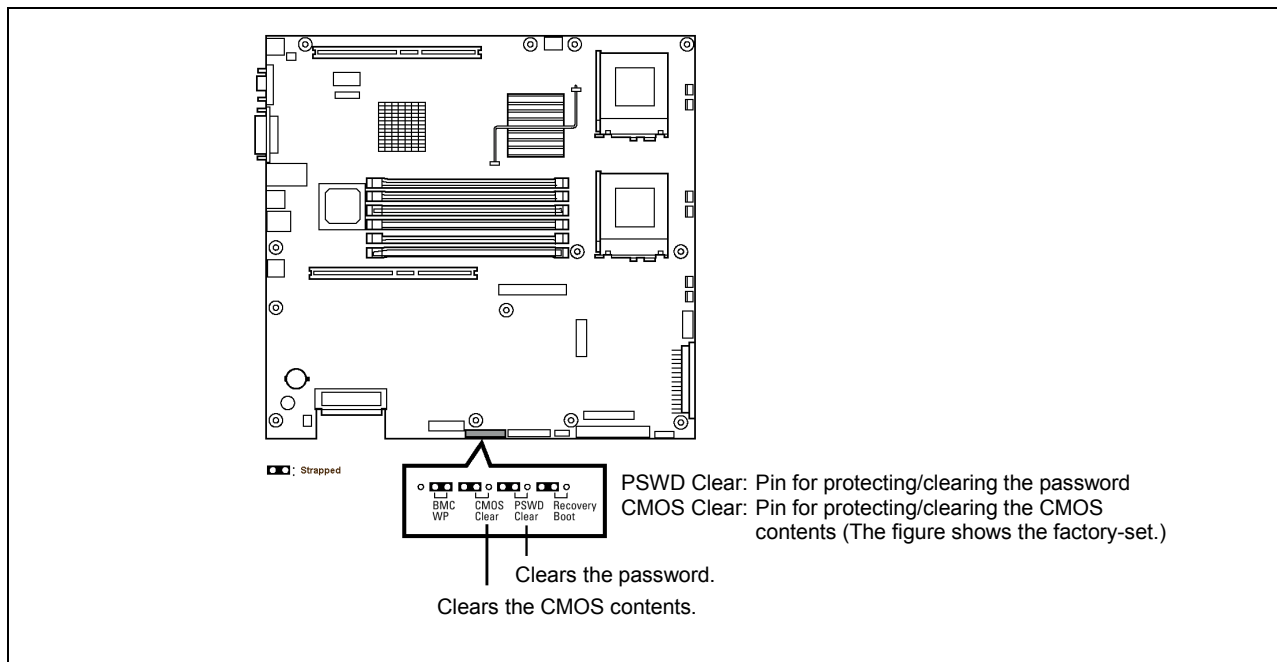
The following describe the clearing procedure.

⚠ **WARNING**
Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See 'Using This Guide" for details.   ■ Do not disassemble, repair, or alter the server.   ■ Do not remove the lithium battery.   ■ Do not connect the ground line to a gas pipe.

⚠ **CAUTION**
Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See 'Using This Guide" for details.   ■ Do not lift the server only by a single person.   ■ Make sure to complete board installation.   ■ Do not install the server on a rack with leaving covers removed.   ■ Do not pinch your finger with mechanical components.   ■ Note high temperature.   ■ Do not pull out a device from the rack if the rack is unstable.   ■ Do not leave more than one device being pulled out from the rack.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Pull out the server from the rack.

3. Open the top cover.

4. Change the setting of the jumper switch of the target function to clear (PSWD or CMOS Clear).

   IMPORTANT: Be careful not to lose the clip.

5. Assemble the server as it was, and press the POWER switch.

   The following messages are displayed at completion of POST:

   ```
   ERROR:
   0120: NVRAM cleared By jumper

   Press <F1> to Resume, Press <F2> to run SETUP.
   ```

6. Press the **F2** key to activate the SETUP utility.

7. Select [Exit Saving Changes] from the [Exit] menu, and then [Yes].

8. Wait until the message "Turn off power and reinstall the jumper in Normal mode position" appears.

9. Turn off the system power switch.

10. Change the jumper switch setting back to the original, turn on the power, and then define the setting by using the BIOS SETUP utility.

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Chapter 4

Installing the Operating System

This section describes how to use Express Setup to install and configure the following operating systems on your server.

- Microsoft$_®$ Windows$_®$ 2000
- Microsoft$_®$ Windows NT$_®$ 4.0
- Novell$^®$ NetWare$^®$
- SCO OpenServer™ 5.0.X

To install operating systems not described in this section, contact your service representative.

> **IMPORTANT:** Before installing the operating system, adjust the system date and time by using the BIOS set up utility "SETUP." See Chapter 3 for detail.

About Express Setup

"Express Setup" contained in your EXPRESSBUILDER CD is intended for initial setup of the server. Its automatic installation mode guides the user through the process by detailing specific hardware features and providing screen prompts for software selection and configuration. "Express Setup" loads the utilities and drivers, applies RAID settings, partitions the disk, and installs the desired operating system.

> **IMPORTANT:** Express Setup is intended for the initial setup of the server system. Therefore, it clears any prior content of the hard disk.
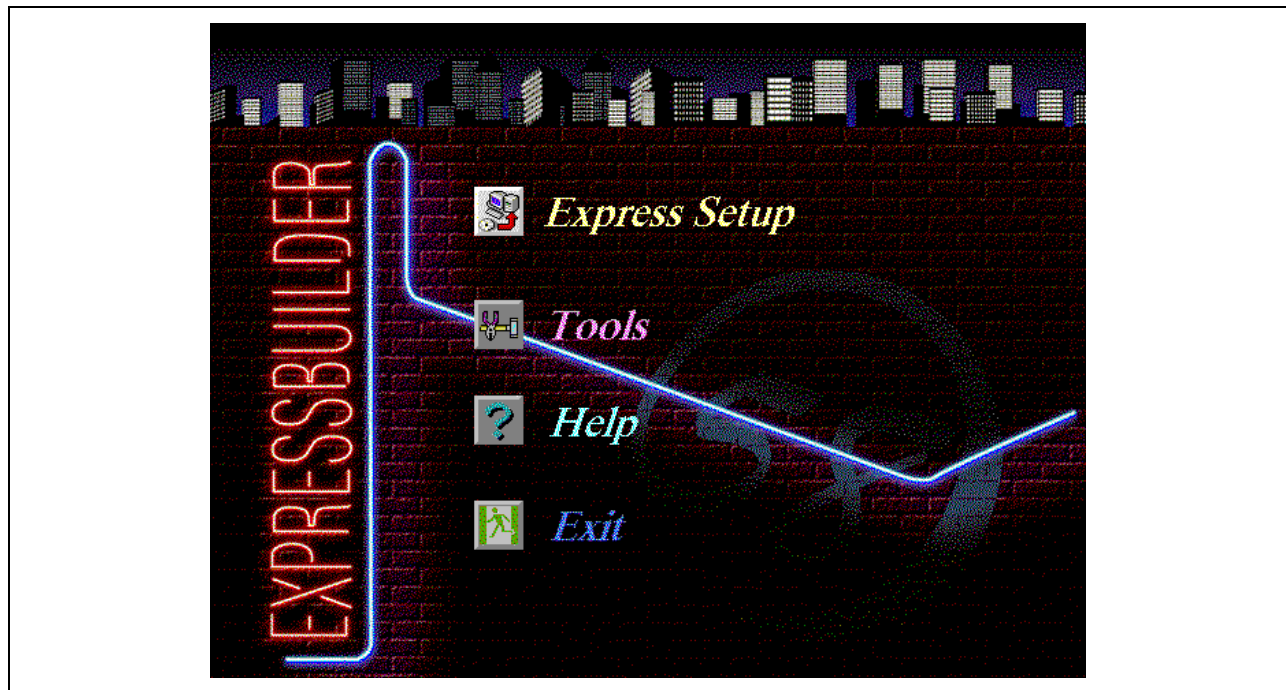
For Microsoft Windows 2000 and Windows NT 4.0, Express Setup automatically configures your server and installs the operating system. After some initial setup, you need to remove the EXPRESSBUILDER CD and insert the Windows CD, input a product ID number, and acknowledge the license agreement.

For Novell NetWare and the other operating systems, Express Setup initializes the target disk(s), creates the maintenance partition, and installs the various maintenance utilities from the EXPRESSBUILDER CD to prepare your server to a ready-to-install state for the desired operating system.

Express Setup requires a "Configuration Diskette". The Configuration Diskette is a floppy disk that includes the configuration information for the server to be automatically installed. Express Setup will perform the entire process of the setup using the information in the floppy disk. During this procedure, you do not have to be in front of the Express server to confirm the state of the setup. Also, using the same Configuration Diskette used before allows you to re-setup your server with the same condition as before.

Express Setup includes two types of installation method.

- Quick start

  Quick start uses a Configuration Diskette with configuration parameters for the server, which were pre-specified before starting the Express Setup. Configuration parameters can be pre-specified by using Express Setup for Windows (see EXPRESSBUILDER User's Guide on the EXPRESSBUILDER CD).

- Normal start

  Normal start creates the Configuration Diskette during Express Setup.

  NOTES:

  - To perform Express Setup, BIOS Setup must prioritize the CD-ROM drive before the diskette drive and hard drive.

  - You can create Configuration Diskette in advance using "Express Setup for Windows" included in EXPRESSBUILDER.

  - By creating the Configuration Diskette in advance, you can minimize the number of items that is necessary to input or select during Express Setup. (You can also create or modify the setup information stored on a Configuration Diskette during Express Setup.) If you have a computer other than Express5800 server that is running with Windows 95/98, Windows NT 3.51 or later, or Windows 2000, we recommend you to edit setup information from the computer in advance using Express Setup for Windows.

  For more information on how to create Configuration Diskette using Express Setup for Windows, see EXPRESSBUILDER User's Guide on the EXPRESSBUILDER CD.

Microsoft Windows 2000

This subsection provides information on installing Microsoft® Windows® 2000 on your server. Read the instructions in this section before performing the installation.

> **NOTE:** To install Windows 2000 without using Express Setup, see Appendix C.

Installation Notice

This section explains precautions and matters you should be aware of before beginning installation in order to install Windows 2000 correctly.

Supported OS on this model

The server supports the following Windows 2000 versions:

- Microsoft Windows 2000 Server version (Described as "Windows 2000" from now on.)
- Microsoft Windows 2000 Advanced Server version (Described as "Windows 2000" from now on.)

Installing Optional Mass Storage Driver

To install the optional mass storage driver, see "Installing Optional Mass Storage Driver" of "Express Setup for Windows" to create the setup file. See EXPRESSBUILDER User's Guide on the EXPRESSBUILDER CD.

BIOS Specification

Before installing Windows 2000, confirm that the BIOS specification of the hardware is correct. In BIOS Setup, there are specific settings required for the new functions provided from Windows 2000 (Plug and Play, support for USB interface and so on). See Chapter 3 to specify them.

Windows 2000

Express Setup can install the Windows 2000 operating system. However, note the following issue:

> ### IMPORTANT:
> - Before starting the installation, complete the addition of optional boards and settings of required BIOS values.
>
> - Use this User's Guide when installing Windows 2000 on this server system. Do not use the installation guide for installing Windows 2000 that may be packaged with other software not supplied with this system.
>
> - After completing Express Setup, see "Setup for Problem Resolution" described later to configure your system to facilitate problem resolution and recovery.

Installing on the Mirrored Volume

If you want to install Windows 2000 on a volume that has been mirrored using "Disk Management", you must invalidate the mirror before re-installing the system on a basic disk, and reconfigure the mirror after the installation has completed.

Management of a mirror volume can be performed from "Disk Management" under "Computer Management".

Connecting Magnetic Optical (MO) Device

If you are installing Windows 2000 with a MO device connected to the system, the installation may not be completed correctly. In this case, remove the MO device and then reinstall the system.

Connecting Hard Disk Drive

The hard disk drive that is to contain the OS can only be connected to a different SCSI controller after the OS is installed on it.

Specifying Partition Size

The minimum size for the partition that the system is to be installed can be calculated from the following formula.

> 1000MB + Paging File Size + Dump File Size
> 1000MB   = Size necessary to install the system
> Paging File Size (Recommended)   = Installed Memory Size × 1.5
> Dump file Size   = Installed Memory Size + 12MB

IMPORTANT:

- The above paging file size is necessary for collecting debug information (memory dump). If you set the initial value of paging file size smaller than the 'recommended' value, you may not be able to collect accurate debug information (memory dump).

- If you want to install Microsoft Windows 2000 Advanced Server on a system with more than 4GB memory installed, we recommend you increase the default paging file size by 2060MB.

- The dump file size for a system with more than 2GB memory installed is '2048MB + 12MB'.

For example, if the installed memory size is 512MB, the minimum required partition size would be as follows:

> 1000MB + (512MB × 1.5) + (512MB + 12MB) = 2292MB

NOTES:

To install using Express Setup, calculate the minimum required partition size as follows:

- If not applying a Windows 2000 Service Pack:
  The larger of: 'Minimum Partition Size' described above, or '2000MB'.

- If applying a Windows 2000 Service Pack:
  The larger of: 'Minimum Partition Size' described above + 850MB, or '4095MB'.

Re-installing to a hard disk which has been upgraded to a Dynamic Disk

You cannot reinstall Windows 2000 and preserve a current hard disk partition that has been upgraded to a Dynamic Disk using Express Setup.

If you want to preserve the current partition, see Appendix C to reinstall the system manually.

Disk Configuration (Concerning the area displayed as "MAINTE_P")

"Disk Management" under "Computer Management" may display a "MAINTE_P" partition. This area contains maintenance partition configuration information and utilities. Do not delete this partition.

Setup Flow

This section visually describes the flow of the setup operated by Express Setup.


```
EXPRESSBUILDER
  Express Setup
  Tools
  Help
  Exit
```

☐ : Process that continues automatically

▦ : Process that requires input or selection

Read notes and restrictions.
— Go back
— Confirmed

Select how to install
— No
— Yes

Insert floppy disk into the floppy disk drive.
— Confirmed

Specify Setup Parameter File.
— Terminate
— New File
— Existing File
— Retrieve again

Select OS

Check Setup Parameter File
— If you need to reset the specification
— Incorrect
— Correct

Select whether or not to confirm or modify existing values
— Yes
— No

Confirm the specification and input the value.
— OK
— Re-select

Disk Array Configuration *1
↓
Restart
↓
Creating Recovery Partition
↓
Restart
↓
Installing Utilities
↓
Restart
↓ *2
Creating OS Partition
↓
Restart
↓
Formatting OS Partition
↓
Copying NEC Modules
↓
Copying Selected Application Modules

Insert Windows 2000 CD

Agree to Software License Agreement

Express Setup
↓
Log on Automatically

After restarting the computer, the installation completed.

*1   Performed only when Disk Array Controller Board is installed and a RAID configuration is specified.
*2   If the operating system to be installed is [Others] or [NetWare], Express Setup is completed here.

Installing Windows 2000

This section describes how to setup the system using Express Setup.

Prepare the Configuration Diskette. You can perform the installation without a Configuration Diskette specified in advance, but one floppy disk formatted by MS-DOS 1.44MB will be required.

> **IMPORTANT:**
> - If you modified the system configuration, execute "System Update".
> - If you want to modify or add Graphic Accelerator Driver or the drivers of Network Adapter and so on, see Appendix C.

1. Turn the power of peripheral devices on, and then turn on the server.

2. Insert the EXPRESSBUILDER CD into the CD-ROM drive of the server.

3. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot the EXPRESSBUILDER. (You may also turn power off and then on again to reboot the server.)

    The system will boot from the CD-ROM and EXPRESSBUILDER starts.

4. The "Language Selection Menu" is displayed. Select the language and keyboard to be used to perform Express Setup.

5. Click [Express Setup].

    "Note" will be displayed.

6. Read the instruction carefully and click [OK].

    The message "Insert Configuration Diskette" appears.

7. Insert "Configuration Diskette" into floppy disk drive and click [OK].

    > **NOTE:** If you do not have a pre-specified configuration "Configuration Diskette", insert a blank 1.44MB formatted floppy disk into the floppy disk drive and click [OK].

[Using the specified Configuration Diskette]

The Setup Files contained on "Configuration Diskette" will be displayed.

1) Select the Setup File name to use during the installation.

> **NOTE:** If there is any problem that can not be modified in the Setup File you selected, the message to select another "Configuration Diskette" appears. In this case, select another Setup File or create a new Setup File.

After the Setup File is specified, the message "Do you want to review or modify the Setup File parameters?" is displayed.

2) If you want to review or edit the information file, click [Yes]. If you do not want to review or edit the information file but continue the installation, click [Skip].

If [Yes] → Go to step 8.

If [Skip] → Go to step 9.

[Using Blank disk]

3) Click the box under [Setup File Name: (A)] or press **A**.

The input box appears.

4) Input the file name.

[Operating System to Install] appears.

The OS supported by the computer is displayed in the list.

5) Select [Windows 2000] you want to install from the list box.

8. Confirm the contents specified during OS installation.

Under "Language Information" specify the language version of the operating system to be installed and the keyboard to be used on the installed system.

If a Disk Array Controller Board is installed in the Express server, the [Configure RAID] screen appears. Confirm the RAID configuration, modify if necessary, and then click [Next].

Next, [Basic Information] screen appears. Confirm the existing values, modify as required, and then click [Next]. ("Supported Computer" shown in the screen differs according to the model.)

After, click [Next], [Back], or [Help] on the screen to continue. Modify the existing values as required.

IMPORTANT:

■ Modify the partition size to install the OS on a partition larger than the minimum required size.

■ If you select "Use Existing Partition" at "System Partition", the data files contained in the first partition (excluding recovery partition) will be deleted and reformatted. The data files contained in the other partition will be retained.

Example:

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Forth Partition Retained

■ You can not re-install the system and preserve an existing partition that has been upgraded to a Dynamic Disk using Express Setup.

■ If "Create New Partition" is selected at "System Partition", do not specify a value for the partition larger than the available disk area.

■ If you specify a partition size larger than 2000MB, you must specify "convert to NTFS".

■ If "Use Existing Partition" at "System Partition" is selected but the partition selected to install Windows 2000 is the only partition (except for maintenance partition); Express Setup will reserve the maximum area of the hard disk to install Windows 2000.

■ You can not go to the next screen if an incorrect value is specified.

■ If a specified value is inconsistent with values previously specified, it may be necessary to go back to modify them.

■ During the Windows 2000 setup, a screen appears to specify the partition that Windows 2000 is to be installed on. The first 16MB area displayed on the screen is a maintenance partition that is used to store the configuration information or utilities unique to the server. This partition must not be deleted. If you do not want to reserve this 16MB area, you must perform the installation by manual setup. Express Setup requires the use of this maintenance partition.

NOTES:

- If you click [Cancel] in [Basic Information] screen, Express Setup will go back to allow you to reselect the Setup File. [Cancel] exists only in [Basic Information] screen. You can use [Back] in subsequent screens to return to the [Basic Information] screen.

- If you click [OK] rather than [Next] in [Role of Computer] screen, setup will automatically select default values for the later screens and continue the installation.

When you complete the setting of setup parameter values, the system will reboot.

9. When prompted remove the EXPRESSBUILDER CD and the Configuration Diskette, and insert the Windows 2000 CD-ROM into CD-ROM drive.

   The [Software License Agreement] screen appears.

10. Read the contents carefully and click [I agree.] or press **F8** if you do agree. If you do not agree, click [I disagree] or press **F3**.

    IMPORTANT:

    - If you do not agree to this agreement, the setup terminates and Windows 2000 will not be installed.

    - If "NetWare Gateway (and Client) Service" is to be installed, a window to specify the details of "NetWare Gateway (and Client) Service" will be displayed at the first logon.

11. If you selected [Apply] on [Apply Service Pack] at Basic Information, follow the procedure below.

    1) When prompted take the Windows 2000 CD out of CD-ROM drive then click [OK].

    2) When prompted insert the Windows 2000 Service Pack into the CD-ROM drive and then click [OK].

    Windows 2000 and any specified applications will be installed automatically and the local administrator will be automatically logged on to the system. Express Setup has now completed. Install and configure the device drivers, as described in the following section.

Installing and Configuring Device Drivers

Follow these steps to install and configure the device drivers.

Network Driver

Specify the details of network driver.

The standard network drivers will be installed automatically, but the link speed and Duplex mode need to be specified manually.

For each network controller:

1. Click Start menu and click [Network and Dial-Up Connection].

   The [Network and Dial-Up Connection] dialog box appears.

2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

   The [Local Area Connection Properties] dialog box appears.

3. Click [Configure].

   The property dialog box for network adapter appears.

4. Click [Advanced] and specify the same [Link Speed & Duplex] value as specified for HUB.

5. Click [OK] on the property dialog box for network adapter.

6. Click [OK] on the [Local Area Connection Properties] dialog box.

Also, add or delete protocols and services as required. Perform these actions from the property dialog box of the local area connection under [Network and Dial-up Connection].

> **NOTE:** We recommend that you add [Network Monitor] under [Adding Services]. [Network Monitor] can monitor frames (or packets) that this computer sends or receives. It is a valuable tool when analyzing network trouble. For information on how to install the [Network Monitor], see the "Setup for Problem Resolution" later in this document.

Install PROSet II

PROSet II is a utility that enhances the functionality of the network driver. Utilizing PROSet II enables the following issues:

- Provides detailed adapter information.
- Provides diagnostic capabilities: loop back test, packet transmission test and so on.
- Provides support for adapter teaming.

Configuring several network adapters as a single team provides the server an environment that is tolerant of adapter failures and enhances through put across the teamed adapters.

Follow the procedure below to install PROSet II.

1. Insert the EXPRESSBUILDER CD into the CD-ROM drive.
2. When the EXPRESSBUILDER window appears, click "Driver & Utilities" on the "EB ToolBar".
3. Select Intel, click on "PROSet II for Windows 2000" under Intel Advanced Network Services.

   The [Intel (R) PROSet II Setup] dialog starts.
4. In the [Welcome] window, click [Next].

   If the dialog message "Digital Signature could not been found." appears, select [Yes].
5. Click [Finish].

   [Intel (R) PROSet II Setup] has completed.
6. Restart the system.

Graphic Accelerator Driver

Update the installed standard graphic accelerator driver.

If you want to utilize an optional Graphic Accelerator Driver board, follow the instructions provided with the board to install the driver.

1. Insert the EXPRESSBUILDER CD into the CD-ROM drive.
2. When the EXPRESSBUILDER windows opens, click "Drivers & Utilities" on the "EB Toolbar".
3. Select ATI. Click on "Rage XL Driver for Windows 2000."
4. Follow the displayed messages to continue the installation.

   If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue.
5. Remove the EXPRESSBUILDER CD from the CD-ROM drive, follow the directions on the screen and restart the system.

Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)

Adapter Fault Tolerance (AFT) is a feature that creates a team containing more than one adapter and automatically directs network traffic to the adapters in the team when one of the adapters fails.

Adapter Load Balancing (ALB) is a feature that creates a team containing more than one adapter that enhances through put by balancing the load across the adapters, which are team members. This feature includes AFT feature.

> **IMPORTANT:**
>
> - AFT/ALB setup must be performed after installing the drivers and restarting the system.
>
> - All the adapters specified, as an Adapter Team must be on the same LAN. If they are connected to separate LANs, they cannot perform AFT or ALB.

If you want to utilize AFT/ALB feature, follow the procedure below to setup.

1. Double-click [Intel (R) PROSet II] on the [Control Panel] dialog box.

    The [Intel (R) PROSet II] dialog box appears.

2. Select "Intel 8255x-based PCI Ethernet Adapter (10/100)" in the list and right-click. Pull-down menu appears.

3. Select [Add to Team>] and then click [Create New Team...].

    The [Teaming Wizard] dialog box appears.

4. Select "Adapter Fault Tolerance" or "Adaptive Load Balancing" and click [Next].

5. Check the adapter to join the team and click [Next].

6. Click [Complete].

7. The setup will go back to [Intel (R) PROSet II] dialog box, so click [OK].

8. Restart the system.

Setup for Problem Resolution

Additional steps should be taken to facilitate the resolution of problems that might occur.

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in the server.

> **IMPORTANT:** Memory Dump Information
>
> If any trouble occurs after initiating the process below, a message stating that the system is short of virtual memory may appear, but complete the process. If you restart the system the memory dump may not be stored correctly.

Follow the procedure below to specify.

1. Point to [Settings] in Start menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [System].

   The [System Properties] dialog box appears.

3. Click [Advanced].

4. Click [Startup and Recovery].

5. Enter the location to write the debug information in "Dump File" under "Write Debugging Information".

   e.g. Write the debug information to D drive with the file name "MEMORY.DMP".

      D:\MEMORY.DMP

> **IMPORTANT:**
>
> - Specify "Kernel Memory Dump" under "Write debugging Information."
>
> - Specify a drive where there is a free area greater than the size of "the memory installed on the Express server + 12MB".
>
> - If the installed memory is increased, the size of the debug information (memory dump) to be collected must be increased. If the installed memory size is larger than 2GB, the maximum size of the dump file is 2048MB. The required amount of free space would be "2048MB+12MB".

6. Click [Performance Options].

7. Click [Change] on the [Virtual Memory] dialog box.

8. Modify [Initial Size] in the [Paging File Size for Selected Drive] box to a value larger than "[Recommended Size]", and click [Specify].

> **IMPORTANT:**
>
> - The above paging file size is necessary for collecting debug information (memory dump). If you set the initial value of paging file size smaller than the 'recommended' value, you may not be able to collect complete debug information (memory dump).
>
> - For more information on "Recommended" value, see "Specifying Partition Size" described earlier.
>
> - In anticipation of problems occurring it is recommended that a dump file always be prepared in advance.
>
> - In case the memory is increased, re-specify the paging file size to suit the new memory size.

9. Click [OK].

A message to restart the system may appear. If so, accept the prompt and restart the system.

Windows 2000 Dr. Watson

Windows 2000 Dr. Watson is a debugger for application errors. If any application error is detected,

Dr. Watson records the error and logs diagnostic information (log). Follow the procedure below and specify Dr. Watson to collect diagnostic information.

1. Click [Run] on Start menu.

2. Type "drwtsn32.exe" in the [Open] box, and click [OK].

    The [Dr. Watson for Windows 2000] dialog box appears.

3. Specify the location to store the diagnostic information in the [Log File Path] box.

    The diagnostic information will be stored with the file name "DRWTSN32.LOG".

    > **NOTE:** You can not specify a network path. The file must be on the local computer.

4. Specify the location of crash dump file in the [Crash Dump] box.

    > **NOTE:** "Crash Dump File" is a binary file that can be read with Windows Debugger.

5. Check the following boxes on the [Option] box.

    ☑ Dump Symbol Table
    ☑ Dump All Thread Contents
    ☑ Add To Existing Log File
    ☑ Create Crash Dump File

    For more information on each function above, refer to Online Help.

6. Click [OK].

Network Monitor

Network Monitor can help you to investigate and resolve network problems. To use Network Monitor, you need to restart the system after the installation has completed; therefore it is recommended you install Network Monitor before experiencing network problems.

1.   Point to [Settings] from Start menu and click [Control Panel].

2.   The [Control Panel] dialog box appears.

3.   Double-click [Add/Remove Programs].

4.   The [Add/Remove Programs] dialog box appears.

5.   Click [Add/Remove Windows Component].

6.   The [Windows Components Wizard] dialog box appears.

7.   Check the [Management and Monitoring Tools] check box of the component ON and click [Next].

8.   If the setup asks for a disk, insert Windows 2000 CD into CD-ROM drive and click [OK].

9.   Click [Complete] in the [Windows Component Wizard] dialog box.

10.   Click [Close] in the [Add/Remove Application] dialog box.

11.   Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor]. For information on how to operate Network Monitor, refer to Online Help.

Installing Maintenance Utilities

Various maintenance utilities are contained in your EXPRESSBUILDER CD. See EXPRESSBUILDER User's Guide on the EXPRESSBUILDER CD for installing the utilities on your server or management workstations.

Updating the System - Applying Service Pack -

Update the system per the following cases:

■ CPU is expanded (expanded from single processor to multi-processor).

■ The system configuration was modified.

■ The recovery process was used to recover the system.

Log on to the system with an account that has administrative authority (e.g. Administrator) and insert the EXPRESSBUILDER CD into the CD-ROM drive of the server.

The EXPRESSBUILDER screen appears, click "Drivers & Utilities" on the "EB Toolbar". Select "120Rb-1" and click "Windows 2000 NEC Update Module" and setup will start. After that, follow the prompts to continue the setup process and apply the Service Pack.

Making Backup Copies of System Information

The system information includes the current BIOS settings and other information specific to your server.

You should save this information after completing the system setup.

This backup data will allow you to recover the information.

You can save the information by the following process.

1. Insert the EXPRESSBUILDER CD in the CD-ROM drive and reboot the system.

2. Select [Tools].

3. Select [Off-line Maintenance Utility].

4. Select [System Information Management].

5. Insert a floppy disk in the floppy disk drive.

6. Select [Save].

Microsoft Windows NT 4.0

This subsection provides information on installing Microsoft® Windows NT® 4.0 on your server. Read the instructions in this section before performing the installation.

> **NOTE:** To install Windows NT 4.0 without using Express Setup, see Appendix C.

Installation Notice

This section explains precautions and matters you should be aware of before beginning installation in order to install Windows NT 4.0 correctly.

Supported OS on this model

The server supports the following Windows NT 4.0 versions:

- Microsoft Windows NT Server 4.0 (Described as "Windows NT 4.0" later on.)
- Microsoft Windows NT Server 4.0, Enterprise Edition (Described as "Windows NT 4.0 EE" later on.)

Installing Optional Mass Storage Driver

To install the optional mass storage driver, see "Installing Optional Mass Storage Driver" of "Express Setup for Windows" to create the setup file. See EXPRESSBUILDER User's Guide on the EXPRESSBUILDER CD.

Windows NT 4.0 /Windows NT 4.0 EE

You can fully install Windows NT Server 4.0 (Windows NT 4.0) and Windows NT 4.0 Enterprise Edition (Windows NT 4.0 EE) using Express Setup. However, note the following issue:

IMPORTANT:

- Before starting the installation, complete the addition of optional boards and settings of required BIOS values.

- Use this User' Guide when installing Windows NT 4.0 on this server system. Do not use the installation guide for installing Windows NT 4.0 that may be packaged with other software not supplied with this system.

- Service Pack
  Express Setup can apply "Service Pack 5" or later on the system.
  If you want to apply Service Pack older than Version 5, select [Do not Apply] in [Apply Service Pack] item when creating the Setup File to setup the system, and perform the "System Update" described later.

- After completing Express Setup, see "Setup for Problem Resolution" described later to configure your system to facilitate problem resolution and recovery

- If more than one network adapter is connected, specify the IP address for each adapter after starting OS.

Magnetic Optical (MO) Device

If you specify the file system as NTFS with a MO Device connected during the installation; the file system will not be converted normally. In this case, Disconnect MO Device and restart the installation from the beginning.

Disk Configuration

- Disk Administrator may display an area labeled "EISA Utility"

  This area is a maintenance partition, which contains configuration information and utilities. Do not delete this area.

- Others

  - If you want to install Windows NT 4.0 on a volume that has been mirrored using "Disk Management", you must invalidate the mirror before re-installing the system on a basic disk, and reconfigure the mirror after the installation has completed.

  - Management of a mirror volume can be performed from "Disk Management" under "Computer Management".

    > **NOTE:** Management of a mirrored volume is performed from the [Fault Tolerance] menu of Disk Administrator.

  - If you want to create a Backup Domain Controller of Primary Domain Controller that has exceeded the router, do not use Express Setup and perform manual setup.

Specifying Partition Size

The minimally required size for the partition to install the system can be calculated from the following expression:

    200MB + Paging File Size + Dump File Size
    200MB   = The size necessary for installing the system
    Paging File Size (Recommended)   = Mounted Memory Size + 12MB
    Dump File Size   = Mounted Memory Size + 12MB

> **IMPORTANT:** The above paging file size is the least required size for collecting debug information (memory dump).

Specify the value larger than the "Recommended" value. If the default paging file size is specified smaller than the "Recommended" value, complete debug information (memory dump) may not be collected.

For example, if the mounted memory size is 512MB, the minimally required partition size can be calculated as follows:

    200MB + (512MB + 12MB) + (512MB +12MB) = 1248MB

Setup Flow

This section describes the flow of how to setup using Express Setup.


```
            ☐         : Process that continues automatically

            ☐         : Process requires input or selection
```

Read notes and restrictions.
Go back ← | Confirmed

Select the method of the installation.
No ← | Yes

Insert floppy disk.
Confirmed

Specify Setup Parameter File.
Create New File | Use Existing File | Detect again
Abort

Select OS | Check Setup Parameter File | Requires to detect again
abnormal | normal

Select whether or not to confirm/modify the existing values
Yes | No

Confirm/input the specification
OK | Re-select

Disk Array Configuration *1
↓
Restart
↓
Creating Maintenance Partition
↓
Restart
↓
Installing Utilities
↓
Restart
↓ *2
Creating OS Partition
↓
Restart
↓
Formatting OS Partition
↓
Copying NEC Modules
↓
Copying Selected Application Modules

Install Graphic Accelerator Driver   *3

Insert Update Media   *4

Insert Windows NT CD-ROM

Agree to Software License Agreement

Copy Window NT CD-ROM

Insert Service Pack CD-ROM

Automatic Installation
↓
Log on Automatically

After the reboot, the installation is completed.

*1 This step occurs only when Disk Array Controller Board is connected and a RAID configuration is specified.
*2 If the operating system to be installed is [Others] or [NetWare], the process is completed here.
*3 This step occurs only when optional graphic accelerator board is connected.
*4 This step occurs only when you specify to apply update media during the installation.

Installing Windows NT 4.0

This section describes how to setup the system using Express Setup.

Prepare Configuration Diskette. You can perform the installation without a Configuration Diskette specified in advance, but one floppy disk formatted by MS-DOS 1.44MB will be required.

IMPORTANT: If you want to install Windows NT 4.0

- If you modified the system configuration, execute "System Update".

- Service Pack
  Express Setup can apply Service Pack 5 or later to the system. If you want to apply Service Pack older than Version 5, select [Do not Apply] in the [Apply Service Pack] item when creating the Setup File to setup the system, and perform "System Update" described later.

---

1. Turn the power of peripheral devices on, and then turn on the server.

2. Insert EXPRESSBUILDER CD into the CD-ROM drive of the server.

3. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot the EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

   The system will boot from the CD-ROM and EXPRESSBUILDER starts.

4. The "Language Selection Menu" is displayed. Select the language and keyboard to be used to perform Express Setup.

5. Click [Express Setup].

   "Note" will be displayed.

6. Read the instruction carefully and click [OK].

   The message "Insert Configuration Diskette" appears.

7. Insert "Configuration Diskette" into floppy disk drive and click [OK].

NOTE: If you do not have a pre-specified configuration "Configuration Diskette", insert a blank 1.44MB formatted floppy disk into the floppy disk drive and click [OK].

[Using the specified Configuration Diskette]

The Setup Files contained on "Configuration Diskette" will be displayed.

1) Select the Setup File name to use during the installation.

> **NOTE:** If there is any problem that can not be modified in the Setup File you selected, the message to set another "Configuration Diskette" appears. In such case, confirm the floppy disk you inserted.

After the Setup File is specified, the message "Do you want to review or modify the Setup File parameters?" is displayed.

2) If you want to review or edit the information file, click [Yes]. If you do not want to review or edit the information file but continue the installation, click [Skip].

If [Yes] → Go to step 8.

If [Skip] → Go to step 9.

[Using Blank disk]

1) Click the box under [Setup File Name: (A)] or press **A**.

The input box appears.

2) Input the file name.

[Operating System to Install] appears.

The OS supported by the computer is displayed in the list.

3) Select [NT 4.0] from the list box.

8. Confirm the contents specified during OS installation.

Under "Language Information" specify the language version of the operating system to be installed and the keyboard to be used on the installed system.

If a Disk Array Controller Board is installed in the Express server, the [Configure RAID] screen appears. Confirm the RAID configuration, modify if necessary, and then click [Next].

Next, [Basic Information] screen appears. Confirm the existing values, modify as required, and then click [Next]. ("Supported Computer" shown in the screen differs according to the model.)

After, click [Next], [Back], or [Help] on the screen to continue. Modify the existing values as required.

IMPORTANT:

- Modify the partition size to install the OS on a partition larger than the minimum required size.

- If you select "Use Existing Partition" at "System Partition", the data files contained in the first partition (excluding recovery partition) will be deleted and reformatted. The data files contained in the other partition will be retained.

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Forth Partition Retained

- You can not go to the next screen if an incorrect value is specified.

- If a specified value is inconsistent with values previously specified, it may be necessary to go back to modify them.

- If a partition larger than 4GB is specified, you must apply "Service Pack 5" or later. If so, you can not uninstall Service Pack 5 after starting Windows NT.

NOTES:

- If you click [Cancel] in [Basic Information] screen, the Express Setup will go back to allow you to reselect the Setup File. [Cancel] exists only in [Basic Information] screen.

- If you click [Complete] rather than [Next] in [Role of Computer] screen, setup will automatically select default values for the later screens and continue the installation.

When you complete the setting of setup parameter values, the system will reboot.

9. When prompted, remove the EXPRESSSBUILDER CD from the CD-ROM drive, and insert Windows NT CD into the CD-ROM drive.

    The [Software License Agreement] screen appears.

10. Read the contents carefully and click [I agree.] if you do agree. If you do not agree, click [I disagree.].

    > **IMPORTANT:** If you do not agree to this agreement, the setup terminates and Windows NT 4.0 will not be installed.

11. When prompted, remove the Configuration Diskette from the floppy disk drive and Windows NT CD from the CD-ROM drive.

12. If you have specified to apply Service Pack 5 or later, insert the specified version of Service Pack into CD-ROM drive, when prompted.

    Windows NT 4.0 is installed automatically, and the local administrator is automatically logged on to the system.

    > **NOTE:** If Backup Domain Controller was specified, the system does not logon the administrator automatically.

    Install and configure the device drivers as described in the following section.

Express Setup has completed.

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

Network Driver

Specify the details of network driver.

The standard network drivers will be installed automatically, but the link speed and Duplex mode need to be specified manually. For each network controller:

1. Select [Settings] from the Start pop-up menu and click [Control Panel].

    The [Control Panel] dialog box appears.

2. Double-click [Network].

    The [Network] dialog box appears.

3. Click [Adapter], select network driver, and click [Properties].

    The [Intel(R) PROSet II] dialog box for network adapter appears.

4. Click [Advanced] and specify the same [Link Speed & Duplex] value as specified for HUB.

5. Click [OK] on the [Intel(R) PROSet II] dialog box for network adapter.

6. Click [OK] on the [Network] dialog box.

    Also, add or delete any protocols and services as required. You can perform these actions from the [Network] dialog box. Click [Protocol] to display the window to specify the protocols.

Graphic Accelerator Driver

> **IMPORTANT:** Use Windows NT 4.0 Service Pack

1. Insert the EXPRESSBUILDER CD into CD-ROM drive.

2. When the EXPRESSBUILDER window opens, click on "Drivers & Utilities" in the "EB toolbar".

3. Select ATI, then click on "Rage XL Driver for Windows NT."

4. Follow the prompts and messages to complete the installation.

Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB) Setup

Adapter Fault Tolerance (AFT) is a feature that creates a team containing more than one adapter and automatically directs network traffic to the adapters in the team when one of the adapters fails.

Adapter Load Balancing (ALB) is a feature that creates a team containing more than one adapter that enhances through put by balancing the load across the adapters, which are team members. This feature includes AFT feature.

If you want to utilize AFT/ALB feature, follow the procedure below to setup.

> **IMPORTANT:**
> - To utilize AFT/ALB, you have to apply Service Pack 5 or later.
> - AFT/ALB setup must be performed after installing the drivers and restarting the system.
> - All the adapters specified, as an Adapter Team must be on the same LAN. If they are connected to the separate LANs, they cannot perform AFT or ALB.

1. Double-click [Intel (R) PROSet II] on the [Control Panel] dialog box.

    The [Intel (R) PROSet II] dialog box appears.

2. Select "Intel 8255x-based PCI Ethernet Adapter (10/100)" in the list and right-click.

    Pull-down menu appears.

3. Select [Add to Team>] and then click [Create New Team...].

    If Service Pack 5 or later is not applied to the system, a window to notify you of that will be displayed at this point. In this case, click [OK] and go back to [Intel (R) PROSet II] dialog box, click [Cancel], apply Service Pack 5 or later and perform AFT/ALB setup again.

    > **IMPORTANT:** If you utilize the AFT/ALB features with a system, which has not had Service Pack 5 applied, the system may behave abnormally. Be sure to apply Service Pack 5 or later before utilizing the AFT/ALB features.

    [Teaming Wizard] dialog box appears.

4. Select [Adapter Fault Tolerance] or [Adaptive Load Balancing] and click [Next].

5. Check the adapter to join the team and click [Next].

6. Click [Complete].

7. The setup will go back to the [Intel (R) PROSet II] dialog box, so click [OK].

    According to the type of protocols and so on, input request for network information may occur at this point.

8. Click [Yes] on the [Reboot Required] dialog box and restart the system.

Setup for Problem Resolution

Additional steps should be taken to facilitate the resolution of problems that might occur.

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in Express server.

> **IMPORTANT:** Cautions for the Memory Dump
>
> - The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
> - If troubles occur after initiating the process below, a message stating that the system is short of virtual memory may appear, but complete the process. If you re-start the system in this case, memory dump may not be stored correctly.

Follow the procedure below to specify.

1. Point to [Settings] in the Start pop-up menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [System].

   The [System Properties] dialog box appears.

3. Click the [Startup/Shutdown].

4. Check [Write an event to the system log].

5. Check [Write debugging information to].

6. Enter the location to write the debug information to the text box.

   e. g. Write the debug information in D drive with the file name "MEMORY.DMP".

   D:\MEMORY.DMP

> **IMPORTANT:**
>
> - Specify the drive where there is a free area greater than the size of "the memory installed on the server + 12MB".
> - If the installed memory is increased, the size of the debug information (memory dump) to be collected must be increased.

7. Click [Performance].

8. Click [Change].

The [Virtual Memory] dialog box appears.

9. Modify [Initial Size] in the [Paging File Size for Selected Drive] box to a value larger than [Recommended Size], and click [Set].

IMPORTANT:

- Be sure to create the memory dump initial file with the size described above on the OS partition. If [Initial Size] of the paging file is specified to the value smaller than "Recommended" value, complete debug information (memory dump) may not be collected.

- For more information on "Recommended" value, see "Specifying Partition Size" described earlier.

- In anticipation of problems occurring it is recommended that a dump file always be prepared in advance.

- In case the memory is increased, change the paging file size to suit the new memory size.

---

10. Click [OK].

A message to restart the system may appear. If so, accept the prompt and restart the system.

Dr. Watson

Windows NT Dr. Watson is a debugger for application errors. If any application error is detected, Dr. Watson diagnoses Express server and logs diagnostic information (log). Follow the procedure below and specify Dr. Watson to collect diagnostic information.

1.   Click [Run] in the Start pop-up menu.

2.   Type "drwtsn32.exe" in the [Name] box, and click [OK].

The [Windows NT Dr. Watson] dialog box appears.

3.   Specify the location to store the diagnostic information in the [Log File Path] box.

The diagnostic information will be stored with the file name "DRWTSN32.LOG".

> **IMPORTANT:** You can not specify a network path. The file must be on local computer.

4.   Specify the location of crash dump file in [Crash Dump] box.

> **NOTE:** "Crash Dump File" is a binary file that can be read with Windows Debugger.

5.   Check the following check boxes on the [Option] box.

☑Dump Symbol Table

☑ Dump all thread contexts

☑ Append to existing file

☑ Create crash dump file

For more information on each function above, refer to Online Help.

6.   Click [OK].

Updating System Recovery Information

To prepare for a situation when the operating system has been destroyed, be sure to "Update Repair Information" as well as "Update the System" when you modified the system configuration so that the system can be recovered correctly in any case. System repair information includes configuration files and registry files.

NOTES:

■ It is possible to save system repair information on a floppy disk, but the information may not fully be saved in one floppy disk when the registry has become large as a result of the installation of additional applications.
   In this case, the recovery disk will not be created correctly, but a message to inform you of that does not appear. On Windows NT, system repair can be performed by reading the repair information that exists on the hard disk, so it is not necessary to create a repair floppy disk.

IMPORTANT:

■ "Update System Recovery Information" is intended to enable you to start the system when some problems occurred on the system and the system will not start. "Update System Recovery Information" is not an operation to backup the system.

■ If the system or its component have been modified during operation, follow the procedure below to perform "Update System Recovery Information".

---

1. Click [Run] in the Start pop-up menu.

2. Type "rdisk.exe" in "File Name" and click [OK].

   The [Repair Disk Utility] dialog box appears.

3. Click [Update Repair Info].

4. Click [Yes].

   The message "Do you want to create System Recovery Disk?" appears.

5. Click [No].

6. Click [Complete].

Network Monitor

Network Monitor can help you to investigate and resolve network problems. To use Network Monitor, you need to restart the system after the installation has completed, so therefore it is recommended you install Network Monitor before experiencing network problems.

Installing Network Monitor during OS Installation

After the selection of network driver has completed, continue the installation until a window to add services is displayed.

1. Click [Select from the List].

The list of [Network Service] appears.

2. Select [Network Monitor Tool and Agent] from the [Network Service] list and click [OK].

Continue the OS installation.

Installing Network Monitor after OS Installation

1. Point to [Settings] from the Start pop-up menu and click [Control Panel].

The [Control Panel] dialog box appears.

2. Double-click [Network].

The [Network] dialog box appears.

3. Click [Service] and click [Add].

The [Select Network Service] dialog box appears.

4. Select [Network Monitor Tool and Agent] from the [Network Service] list and click [OK].

The [Windows NT Setup] dialog box appears.

5. Insert Windows NT CD into CD-ROM drive and click [OK].

If the drive letter of CD-ROM drive is not displayed correctly, modify it to the correct value.

The setup goes back to the [Network] dialog box.

6. Close the dialog box and restart the system.

To start Network Monitor, point to [Program] → [Management Tool] and click [Network Monitor] from the Start pop-up menu. For information on how to operate Network Monitor, refer to Online Help.

Installing Maintenance Utilities

Various maintenance utilities are contained in your EXPRESSBUILDER CD-ROM. Refer to your EXPRESSBUILDER User's Guide for installing the utilities on your server or management workstations.

Updating the System - Applying Service Pack -

Update the system in the situation below:

- The system configuration was modified.
- The recovery process was used to recover the system.

In this case, follow the procedure below to update the system.

> **IMPORTANT:**
> - Be sure to use the Repair Disk Utility to update repair information when the system is updated or install a service pack.
> - No Service Pack is included on EXPRESSBUILDER.

1. Log on to the system with the account that has administrative authority (e.g. Administrator).

2. Insert EXPRESSBUILDER CD into the CD-ROM drive of the server.

3. The EXPRESSBUILDER screen appears. Click on "Drivers & Utilities" on the EXPRESSBUILDER toolbar.

4. Select "120Rb-1." Click on "Windows NT4.0 NEC Update Module" and setup will start.

5. Select the Service Pack you want to apply.

   After that process, follow the message on the window to continue the setup.

Making Backup Copies of System Information

The system information includes the current BIOS settings and other information specific to your server.

You should save this information after completing the system setup.

This backup data allows you to recover the information.

You can save the information by the following process.

1. Insert the EXPRESSBUILDER CD into the CD-ROM drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a floppy disk in the floppy disk drive.
6. Select [Save].

Novell NetWare 5.0

This subsection contains instructions for installing and configuring the Novell NetWare v5.0 Network Operating System on your system.

For additional Novell NetWare information, it is important to read the NetWare "READ ME" files and related documentation provided by Novell.

Note: Read the System Release Notes for the latest system information before attempting to install the Novell NetWare Network Operating System on your system.

Required Diskettes

The drivers required for the devices listed in the table below are located on the EXPRESSBUILDER CD. To create the required diskettes, perform "Custom Setup" on the EXPRESSBUILDER CD.

⚠ CAUTION

When creating the required diskettes from the EXPRESSBUILDER CD make sure you use the drivers required for the devices on your specific system.

Supported Device	Required Diskette*
AIC7899 Onboard Controller	NetWare OEM-Disk for 120Rb-1
NEC SecuRAID 112 (Mylex AcceleRAID 160)	
NEC SecuRAID 320 (Mylex AcceleRAID 352)	
Intel PRO/100+™ LAN Card	

*Generated from the NEC EXPRESSBUILDER CDROM

Installation Assumption

The installation and configuration instructions in this chapter assume the following:

■ You will be installing (not updating) the Novell NetWare 5.0 Network Operating System from the CD-ROM media.

Preparation

The following sections describe the necessary preparation procedures for installing and configuring Novell NetWare v5.0.

Configuring RAID

If you have a disk array controller preinstalled on your system, it was preconfigured at the factory. Refer to your system's *User's Guide* and to the *RAID Installation Guide* and the *Disk Array Controller Installation Guide and User's Manual* for additional information on this option card. If you need to change the RAID level from the factory setting, you must change the setting before installing the operating system.

Configuration Checklist

Certain configuration information must be available before loading the Novell NetWare v5.0 Network Operating System. The following table is a checklist that helps you identify the information you need. You may need to ask your Network Administrator for some of the information.

Configuration Checklist

Step	Information
1	**File Server Name.** Record the file server name for this system. File server name: _____
2	**IPX Internal Network Number.** Record the IPX Internal Network Number for this system. (For more information about IPX Internal Network Numbers, see "IPX Internal Network Numbering" in the Novell *Concepts* manual.) IPX Internal network Number: _____
3	**Country Code and corresponding Code Page**. Choose the Country Code and corresponding Code Page from the following selections. Circle one Country Code and one of the corresponding Code Pages.

Country Code	Code Page
1. United States - 001	1. United States English - 437
—	2. Multilingual - 850
2. French Canada - 002	1. United States English - 437
—	2. French Canadian - 863
3. Latin America - 003	1. United States English - 437
—	2. Multilingual - 850
4. Netherlands - 031	1. United States English - 437
—	2. Multilingual - 850
5. Belgium - 032	1. United States English - 437
—	2. Multilingual - 850
6. France - 033	1. United States English - 437
—	2. Multilingual - 850
7. Spain - 034	1. United States English - 437
—	2. Multilingual - 850

Configuration Checklist (Continued)

Step	Information	
3 (Cont.)	8. Italy - 039	1. United States English - 437
	—	2. Multilingual - 850
	9. Switzerland - 041	1. United States English - 437
	—	2. Multilingual - 850
	A. United Kingdom - 044	1. United States English - 437
	—	2. Multilingual - 850
	B. Denmark - 045	1. Multilingual - 850
	—	2. Nordic - 865
	C. Sweden - 046	1. United States English - 437
	—	2. Multilingual - 850
	D. Norway - 047	1. United States English - 437
	—	2. Nordic - 865
	E. Germany - 049	1. United States English - 437
	—	2. Multilingual - 850
	F. International English - 061	1. United States English - 437
	G. Portugal - 351	1. Multilingual - 850
	—	2. Portuguese - 860
	H. Finland - 358	1. United States English - 437
	—	2. Multilingual - 850

Configuration Checklist (Continued)

Step	Information
4	**Keyboard Mapping.** Choose your keyboard mapping from the following selections. (Circle one selection): 1. France 2. Germany 3. Italy 4. Spain 5. United States 6. None
5	**LAN Adapter.** Choose which type of LAN adapter is installed in the LAN adapter slot. Circle one selection. Intel PRO/100+ No adapter to configure
6	**IPX Network Number.** Record the IPX Network Number associated with the LAN adapter in slot one. (For more information about IPX Network Numbers, see "Network Numbering" in the Novell *Concepts* manual.) IPX Number: _____
7	Repeat steps 5 and 6 for each LAN adapter slot you are using.

Installing the Novell NetWare v5.0 Network Operating System

Note: Before you install the Novell NetWare Operating System, you should have your LAN adapter(s) connected to the LAN network(s). This allows the install process visibility to other servers and Directory Services already installed.

Note: A known problem for NetWare v5.0 always occurs during a new installation of the NetWare 5 Operating System on a computer with a processor speed of 450 MHz or higher. The server either hangs during "Scan for New Devices", or it displays the following error:

> Unable to Find File Z:\SYSTEM\TAR.NLM
> (Where Z: is the drive letter of the CDROM the server boots from.)

To correct this error you can interrupt the installation after the creation of the DOS partition and the initial file copy, then manually create a subdirectory (C:\NWUPDATE), copy the new drivers into that directory, and restart INSTALL.BAT from the NetWare 5 installation CDROM, maintaining the existing partitions.

1. Power on your server.

2. Insert the NetWare 5.0 CD into your CD-ROM drive.

3. Select a language for your locale and press ENTER.

4. Highlight "Accept License Agreement" from the menu and press ENTER.

5. Highlight "Create a New Boot Partition" from the menu and press ENTER.

6. At the boot partition screen, press ENTER to continue.

7. Highlight "Continue" from the "Are You Sure?" menu and press ENTER to create a new boot partition.

8. Press any key to reboot.

9. Highlight "Continue" to accept the default startup directory. Press ENTER.

10. Highlight "Continue" to accept the regional settings. Press ENTER

11. Highlight "Continue" to accept the mouse type and video mode. Press ENTER

12. From the Device Type menu Highlight "Modify". Press ENTER.

13. Highlight "Storage Adapters". Press ENTER.

14. Press INSERT.

15. Press INSERT.

16. Insert "NetWare 5.X OEM-Disk" diskette. Press ENTER.

17. Highlight and press ENTER for each driver listed below:

MDAC.HAM (displayed only if a RAID board is installed)

ADPT160M.HAM

18. Press ESC.

19. Highlight "Return to Drive Summary". Press ENTER.

20. Press ESC.

21. Highlight "Continue". Press ENTER.

22. From the Device Driver menu Highlight "Modify". Press ENTER.

23. Highlight "Network Boards". Press ENTER.

24. Press "Insert" key.

25. Press "Insert" key.

26. Press ENTER.

27. Highlight "Return to Driver Summary". Press ENTER

> *Note:* Repeat steps 25 through 29 for additional Network Boards.

28. Press ESC and return to "Device Driver Summary".

29. Press ESC.

30. Highlight "Continue". Press ENTER.

31. Highlight "Continue" to create a NetWare partition and volume SYS. Press ENTER.

32. At the Server Properties box type in your server name and click "Next."

33. At the Protocols box, click the "Network Board" you want to configure.

34. Once you made your network board selection, specify the network protocol for each network board. Click "Next" to continue.

> *Note:* If you select IP, fill in the IP address, subnet mask and router information appropriately.

35. Select your correct time zone. Click "Next" to continue.

36. Select the NDS installation type for this server. Click "Next" to continue.

> **Note:** For this step we will select "Create a new NDS tree."

37.   Enter your NDS and Administrator information and click "Next" to continue.

38.   Insert your NetWare V5 license disk.

39.   At the NDS Summary screen, click "Next" to continue.

40.   Select "Additional Products and Services" desired and click "Next" to continue.

41.   Click "Finish" at the summary screen.

42.   Remove any diskettes and/or CDs and click "Yes" to restart your server.

43.   Install the appropriate support pack.

Restarting the Server

You should now "restart" the server to initialize your changes.

You can do this by typing the following commands from the **Server_name:** prompt:

restart server

Backing Up the Server

You should now use Novell's Backup Utility or some other backup facility to backup your server.

SCO OPENSERVER 5.0.6

This chapter contains supplemental instructions needed to install and configure hardware and software used with the Santa Cruz Operation (SCO) Network Operating System OpenServer Release 5.0.6. This information is intended to supplement the more detailed procedural documents available from Santa Cruz Operation. This information is not intended to be the central source of installation and configuration information for SCO OpenServer on your system.

> *Note:* Read the System Release Notes for the latest system information before attempting to install SCO OpenServer on your system.

Required Diskettes

> *Note:* Diskettes for the PCI LAN cards and RAID adapter card are generated from the EXPRESSBUILDER CD shipped with the system.

Depending upon the hardware complement in your system, you may require some or all of the diskettes listed in the table below. They should be generated before attempting to install the operating system. Also listed in the table below are the required diskette labels.

⚠ CAUTION

When creating the required diskettes from the EXPRESSBUILDER CD make sure you use the drivers required for the devices on your specific system.

Always read the information in the release notes or inserts, included with any options for they supersede the information in this guide.

Device	Required Diskette[1]
NEC SecuRAID 112 (Mylex AcceleRAID 160)	Mylex AcceleRAID 160/352 Drivers [2] for SCO OpenServer
NEC SecuRAID 320 (Mylex AcceleRAID 352)	
Adaptec 7899 Onboard Controller	Adaptec Ultra 160 Drivers for SCO OpenServer
Intel PRO/100+™ LAN Card	Intel PRO/100+ Driver for SCO OpenServer 5.0.X

[1] Generated from the EXPRESSBUILDER CD.
[2] Required only if RAID controller card is installed.

Preparation

The following sections describe the necessary preparation procedures for installing SCO OpenServer 5.0.6.

⚠ CAUTION

DOS Partitions: MS-DOS allows installation of multiple primary DOS partitions. However, SCO Open Systems Software allows only one primary DOS partition and one extended DOS partition on the boot drive. If you install more than one primary and one extended DOS partition, SCO Open Systems Software will be unable to access *any* DOS partition.

Checking System Configuration

Before installing SCO, make sure that your system configuration is correct. Run the BIOS Setup Utility to check system configuration. Refer to the *Configuring Your System* chapter of your User's Guide for more information on how to run these utilities.

Configuration Checklist

Configuration Checklist

Step	Information
1	**File Server Name.** Record the file server name for this system. File server name: _____
2	**IP Address.** Assign an IP address for each LAN card that is to be installed into the system. Seven maximum. IP Address Number: _____ IP Address Number: _____ IP Address Number: _____ IP Address Number: _____ IP Address Number: _____
3	**License Number.** Record the license number for the SCO OpenServer operating system. License number: _____
4	**License Code.** Record the license code for the SCO OpenServer operating system. License code: _____

Configuring RAID

If you have a disk array controller preinstalled on your system, it was preconfigured at the factory. Refer to your system's *User's Guide* and to the *RAID Installation Guide* and the *Disk Array Controller Installation Guide and User's Manual* for additional information on this option card. If you need to change the RAID level from the factory setting, you must change the setting before installing the operating system.

Installing Optional Hardware

This section contains supplemental hardware installation and configuration information.

Installing Optional Adapters

If you are installing optional adapters, refer to the installation guide that came with the adapter, the SCO documentation and the System User's Guide shipped with your system for installation and configuration information.

The following optional adapter may be added to your system.

Disk Array Controller - Refer to your system's *User's Guide* and to the RAID Installation Guide and the *Disk Array Controller Installation Guide and User's Manual* for additional information on this option card.

Installing Other Hardware

Refer to the *Upgrading Your System* chapter of your System User's Guide for installing additional memory, additional hard disk drives or new peripheral devices.

Where to Go From Here

Now that all your system hardware options are installed, you are ready to install SCO. Go to the *Installing and Configuring System Software* section to perform this task.

Installing and Configuring
System Software

This section contains supplemental information for installing and configuring SCO UNIX® OpenServer® Release 5.0.X Operating System.

Installing SCO OpenServer Rel. 5.0.X Software
without a Disk Array Controller Installed

Note: This section assumes that you have properly completed the hardware installation. If you have not done so, please refer to the corresponding documentation and complete the hardware installation before trying to proceed with driver installation.

Note: Read the *Release Notes* (packaged with your operating system documentation) before starting the installation.

SCO installation instructions in the *SCO UNIX OpenServer Rel. 5.0.6 Handbook* provide more extensive installation procedures. Chapter 2 of the *SCO OpenServer Rel. 5.0X Handbook Installation Guide* includes an installation checklist to assist you in installing or upgrading to SCO UNIX OpenServer 5.0.6.

1. Insert the SCO OpenServer™ Version 5.0.6 CD into the CD-ROM drive and boot your system. You will see the following message:

SCO OpenServer™ Release 5.0.6

Boot:

Type: *defbootstr link= ad160*   *Std=ad160 (0, 0, 0, 0)*

Press ENTER.

2. The installation continues until the system displays this message:

Please insert the fd(65) ad160 volume and press <Return> or 'q' to quit.

3. Insert the Adaptec Ultra 160 Driver for SCO OpenServer 5.0.X diskette (made from the EXPRESSBUILDER CD) into the floppy drive and press ENTER.

4. The system continues until the system displays this message:

Please enter "r' if you wish to try replacement.

Type *r* and press ENTER.

5. The system displays standard SCO OpenServer Rel. 5.0.6 copyright messages such as

Restricted Rights Legend. Use duplication, or disclosure.

Press ENTER to continue.

Press ENTER to accept.

6. The system displays the message:

Identifying the installation media device. Make sure the IDE indicates CD-ROM secondary and master.

Press ENTER.

7. The system displays the message:

Keyboard

Press ENTER.

8. The system displays the message:

Enter License Number and License Code.

Press ENTER.

9. The system displays the message:

Additional License Software — Continue

10. The system displays the message:

"Suitable for Automatic Upgrade"

Enter appropriate Upgrade or Fresh

Press Enter

11. Select OK

12. The system displays the message:

"Configure the Basic System"

Enter appropriate choices.

13. The system displays the message:

"Initial System Profile"

Enter appropriate choices.

14. The system displays the message:

"Preparing Your Disk"

Enter appropriate choices.

15. The system displays the message:

"Configuring Optional Software"

Enter appropriate choices (You may want to select a mouse).

16. The system displays the message:

"Password"

Enter appropriate choices.

17. The system displays the message:

"The Installation can now proceed unattended"

Select OK and Press ENTER.

18. Somewhere toward the end of the installation, the following messages are displayed:

Configuring the kernel driver installation…
Press ENTER to continue:

Press ENTER to continue.

19. When the system has completed its installation, you will see the following message:

Installation and initial configuration of SCO OpenServer Rel. 5.0.X Enterprise System is complete…

Press ENTER to continue:

Press ENTER to continue. The system displays:

** Safe to Power Off **

   - or -

** Press any Key to Reboot **

20. If a SCSI tape drive is attached to channel B of the Adaptec 7899 onboard controller, perform the following steps. This will generate a new idscsi file to correct a kernel/link problem. Otherwise, go to step 24.

21. Start the newly installed system.

22. Insert the Adaptec Ultra 160 Driver for SCO OpenServer 5.0.X disk, which has an additional file that must replace an existing file in the operating system.

23. Log into "Root" and from the "Unix" window issue the following:

"mount -f/dev/fd0/mnt."

"cp/mnt/idscsi/etc/conf/bin"

24. This concludes the installation of SCO OpenServer 5.0.X. You need to open the diskette drive and reboot the SCO OpenServer 5.0.X operating system from the system drive you just installed.

This concludes the installation of SCO OpenServer 5.0.X. You need to open the diskette drive and reboot the SCO OpenServer 5.0.X operating system from the system drive you just installed.

> **Note:** During the installation of SCO or any time thereafter when booting SCO a warning message may appear as follows:
>
> WARNING: Cannot connect to APM, error 0x0036 System loaded, press <Return> to start:
>
> To prevent the WARNING message from appearing, boot the system to single-user Mode. Edit the /etc/default/boot file. Add "apm.check=no" to the end of the line indicated by the "DEFBOOTSTR=" entry.

It is recommended that any additional software packages be installed at this time.

Installing SCO OpenServer Rel. 5.0.6 Software with a RAID Controller Installed

Note: This section assumes that you have properly completed the hardware installation and the drive array configuration. If you have not done so, please refer to the corresponding documentation and complete the hardware installation and configuration before trying to proceed with driver installation.

Installation of SCO OpenServer Version 5.0.6 involves installation of a disk array driver for your disk array system. The procedure basically follows the standard SCO UNIX installation with some variations. During the installation, when prompted, insert the SCO UNIX driver diskette for the Disk Array Controller into the floppy disk drive.

Note: Before installing SCO UNIX, ensure that system drive 0 (boot drive) has been configured for write-through cache. If write-back cache has been configured, the SCO UNIX root file system may be corrupted at the completion of the installation. After the installation is completed, the system drive can be toggled to write-back cache.

1. Insert the SCO OpenServer Version 5.0.6 CD into the CD-ROM drive and boot your system. You will see the following message:

   SCO OpenServer™ Release 5.0.6

   Boot:

   Type: *defbootstr link= "mdac"*
   　　　Sdsk=mdac(0,0,0,1)

   Press ENTER.

2. The system displays this message:

   Please insert the fd(60) mdac volume and press ENTER or press Q to quit.

   Insert the Mylex AcceleRAID 160/352 Drivers for SCO OpenServer diskette (made from the EXPRESSBUILDER CD) into the floppy drive and press ENTER.

3. The system continues with this message:

   Please enter "r' if you wish to try replacement.

   Type *r* and press ENTER.

4. The system continues with these messages:

   mdac: Driver "mdac" successfully loaded.

   Character major = 19

5. The system displays the message:

Please insert (mdac) package BLTD disk into the floppy drive so that it can be extracted onto the hard disk for incorporation into the link-kit.

Insert diskette and press ENTER

6. The system displays standard SCO OpenServer Rel. 5.0.6 copyright messages such as

Restricted Rights Legend. Use duplication, or disclosure.

Press ENTER to continue.

Press ENTER to accept.

7. The system displays the message:

Identifying the installation media device. Make sure the IDE indicates CD-ROM secondary and master.

Press ENTER.

8. The system displays the message:

Keyboard

Press ENTER.

9. The system displays the message:

Enter License Number and License Code.

Press ENTER.

10. The system displays the message:

Additional License Software — Continue

11. The system displays the message:

"Suitable for Automatic Upgrade"

Enter appropriate Upgrade or Fresh

Press Enter

12. Select OK

13. The system displays the message:

"Configure the Basic System"

Enter appropriate choices.

14. The system displays the message:

"Initial System Profile"

Enter appropriate choices.

15. The system displays the message:

"Preparing Your Disk"

Enter appropriate choices.

16. The system displays the message:

"Configuring Optional Software"

Enter appropriate choices (You may want to select a mouse).

17. The system displays the message:

"Password"

Enter appropriate choices.

18. The system displays the message:

"The Installation can now proceed unattended"

Select OK and Press ENTER.

19. Somewhere toward the end of the installation, the following messages are displayed:

Configuring the kernel driver installation…
Press ENTER to continue:

Press ENTER to continue.

20. When the system has completed its installation, you will see the following message:

Installation and initial configuration of SCO OpenServer Rel. 5.0.6 Enterprise System is complete…

Press ENTER to continue:

Press ENTER to continue. The system displays:

** Safe to Power Off **

   - or -

** Press any Key to Reboot **

21. If a SCSI tape drive is attached to channel B of the Adaptec 7899 Onboard Controller, perform the following steps. This will generate a new idscsi file to correct a kernel/link problem. Otherwise, go to step 25.

22. Start the newly installed system.

23. Insert the Adaptec Ultra 160 Drivers for SCO OpenServer disk, which has an additional file that must replace an existing file in the operating system.

24. Log into "Root" and from the "Unix" window issue the following:

"mount -f/dev/fd0/mnt."

"cp/mnt/idscsi/etc/conf/bin"

This concludes the installation of SCO OpenServer 5.0.6. You need to open the diskette drive and reboot the SCO OpenServer 5.0.6 operating system from the system drive you just installed.

> **Note:** During the installation of SCO or any time thereafter when booting SCO a warning message may appear as follows:
>
> WARNING: Cannot connect to APM, error 0x0036 System loaded, press <Return> to start:
>
> To prevent the WARNING message from appearing, boot the system to single-user Mode. Edit the /etc/default/boot file. Add "apm.check=no" to the end of the line indicated by the "DEFBOOTSTR=" entry.

It is recommended that any additional software packages be installed at this time. After all additional software is installed; it is recommended that Maintenance Supplement 505A be installed on your system.

> **Note:** Do not change the system drive 0 (boot drive) cache policy to write-back until after the installation completes.

Installation of Tape Drives

After the installation of SCO OpenServer 5.0.6 is complete, ensure the tape device is configured to the proper controller. If reconfiguring is necessary, follow the instructions in the hardware section of the SCO OpenServer Rel. 5.0.6 Handbook.

Installation of CD-ROM Drives

Ensure that the CD-ROM device is connected to the proper controller. If reconfiguring is necessary, follow the instructions in the hardware section of the SCO OpenServer Rel. 5.0.6 Handbook.

Adding System Drives

After installing SCO OpenServer on system drive 0 (root drive), it may be necessary to create additional file systems on any other system drives. Use the command "mkdev hd" to partition and create file systems on additional system drives.

Installing the Intel PRO/100+ LAN Card Driver from a Diskette

The driver for the Intel PRO/100+ LAN card is generated from the EXPRESS BUILDER CD.

To load an Intel PRO/100+ LAN card driver, insert the Intel PRO/100+ Driver diskette into your disk drive and logon to the SCO Open Server graphical interface. Use the following procedure to install the driver.

1. Select the *Software Manager* icon from the Main Menu display.

2. Within the menu bar click on *Software.* A pull-down menu displays.

3. Select *Install New*. A dialog box displays asking if you are installing the driver from the host system or another host.

4. Highlight the host system in which the driver media is installed and press ENTER (click on Continue).

5. A dialog box displays asking for the media device used for this installation. Select the media device (usually the floppy diskette drive) and press ENTER (click on Continue).

6. A dialog box displays the driver(s) read from the media. Select the appropriate driver and press ENTER (click on Full).

7. A dialog box appears. Please use *netconfig* to configure network software, press return to continue. Press ENTER.

8. A message dialog box displays indicating *"Installation complete."* Press **ENTER** or select *OK*.

9. The Software Manager displays the loaded driver.
   Select *Exit* from the *Host* pull down menu.

Configuring the Intel PRO/100+ LAN Card

1. Select the *System Administration* icon from the Main Menu display.

2. Select the *Networks* icon.

3. Select the Network Configuration Manager.

4. Select the *Hardware Options* pull-down menu and choose *Add New LAN Adapter*.

5. Highlight the card to be installed.

6. Select *Continue.*

7. When the *Add Protocol* menu is displayed select *SCO TCP/IP*, then select *ADD*.

8. Enter the required information to configure TCP/IP, then select *OK*. Refer to the *SCO OpenServer Handbook, Appendix A, TCP/IP Configuration Parameters*.

> 📰**Note:** When configuring multiple sub-networks on the same system, the system names for each sub-network must be unique.

9. At the "Product successfully completed" message, select *OK*.

10. After the configuration is complete and the current networking configuration is displayed, select *Hardware* from the menu bar, and then select *Exit*.

11. At the message the "UNIX kernel must be relinked...", select *YES* to relink the kernel.

12. At the message "Do you want this kernel to reboot by default", enter YES and press ENTER.

13. At the message "Do you want the kernel environment rebuilt", enter YES and press ENTER.

14. Press ENTER to continue.

15. Reboot your system.

Configuring Additional Hard Disks

Configuring additional hard disk drives requires that they be hardware configured and low-level formatted (most disks are shipped already low-level formatted).

For SCO OpenServer Rel. 5.0.6 Software to recognize more than one hard disk drive, you must execute a series of commands. For a detailed description of the commands, refer to the chapter entitled "Adding Hard Disks and CD-ROM Drivers" in the *SCO UNIX Operating System Administrator's Guide* or the *SCO Open Systems Rel. 5X Hardware Configuration Guide*.

An example of the command sequence is shown below:

> SCSI Disks
> *mkdev hd*
> (build a kernel)
> (reboot the system)
> *mkdev hd*
> *mkdev fs*
> *mountall*

Refer to the on-line SCO *man* page for information on the *mkdev* (ADM) command.

Chapter 5

Maintenance

This chapter describes the daily maintenance of the server and precautions when relocating or storing the server.

MAKING BACKUP COPIES

It is recommended that you make backup copies of your valuable data stored in hard disks of the server on a regular basis. For backup storage devices suitable for the server and backup tools, consult with your sales agent.

When you have changed the hardware configuration or BIOS configuration, select "System Information Management" and then "Save" of the Off-line Maintenance Utility to make a backup copy of the system information.

Also make a backup copy of the disk array configuration data if your system is in the array configuration. When your hard disks have been auto-rebuilt due to a failure, it is recommended to make a backup copy of the configuration data. To make a backup copy of the configuration data, use the configuration utility that is resident in the FLASH memory on the optional disk array controller board. Refer to the manual supplied with the board.

CLEANING

Clean the server on a regular basis to keep the serer in a good shape.

⚠ WARNING
Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. ■ Do not disassemble, repair, or alter the server. ■ Do not look into the CD-ROM drive. ■ Do not remove the lithium battery. ■ Disconnect the power plug before cleaning with the server.

⚠ CAUTION
Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. ■ High temperature ■ Make sure to complete board installation.

Cleaning the Server

For daily cleaning, wipe the external surfaces of the server with a dry soft cloth. Follow the procedure below if stains remain on the surfaces:

IMPORTANT:

- To avoid altering the material and color of the server, do not use volatile solvents such as thinner and benzene to clean the server.

- The power receptacle, the cables, the connectors on the rear panel of server, and the inside of the server must be kept dry. Do not moisten them with water.
---

1. Make sure that the server is off-powered (the POWER/SLEEP lamp goes off).

2. Unplug the power cord of the server from a power outlet.

3. Wipe off dust from the power cord plug with a dry cloth.

4. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.

5. Rub off stains on the server with the cloth prepared in Step 4.

6. Soak a soft cloth in water, squeeze it firmly, wipe the server with it once again.

7. Wipe the server with a dry cloth.

8. Wipe off dust from the fan exhaust opening on the rear of the server with a dry cloth.

Cleaning the Interior

One of the most important items in a good maintenance program is regular and thorough cleaning of the interior of the server, especially around the system board.

Dust buildup inside the server can lead to several problems. As dust acts as a thermal insulator, a buildup can prevent proper system cooling. Excessive heat will shorten the life of server components. Also, dust may contain conductive or corrosive materials that can cause short circuits or corrosion of electrical contacts.

How often you should clean the interior of the server depends on the environment in which it is located. For most office environments, you probably should clean the server every 12 months. For more severe environments, clean the interior every 6 months.

Cleaning the interior of the server entails powering off the server and removing the left side cover. You will need a small vacuum cleaner (with plastic tipped nozzle and electrostatic protection), computer grade canned air, and a small brush for cleaning the interior.

Follow the procedure below to clean the interior of the server.

⚠ WARNING
Unplug all power cords.
Unplug all power cords before performing any maintenance. Voltage is present inside the server and display unit even after the power is turned off. All voltage is removed only when the power cord is unplugged.

1. Turn off the server and unplug all power cables.

2. Remove the top cover. (See Chapter 7.)

3. Use a small brush to loosen any dust and debris on the system board.

4. Use computer grade canned air to blow dust off components on the system board.

5. Use a small vacuum cleaner with plastic tip to vacuum out dust and debris from the interior of the server.

6. Reinstall the top cover. (See Chapter 7.)

7. Reconnect all power cables and turn on the server.

Cleaning the Keyboard/Mouse

Make sure that the server and peripheral devices are all off-powered (the POWER lamp goes off), and then wipe the keyboard surface with a dry cloth.

The mouse operation depends on the degree of smoothness of the internal ball rotation. To keep the mouse ball clean, use the mouse in a place with little dust. Follow the steps below to clean the mouse regularly:

1.   Prepare cold or lukewarm water, neutral detergent, alcohol, two dry soft clothes, and cotton swabs.

2.   Make sure that the server is off-powered (the POWER/SLEEP lamp goes off).

3.   Turn the mouse upside down, and rotate the mouse ball cover counterclockwise to remove it.

4.   Take out the ball from the mouse. Cover the bottom of the mouse with your hand, and turn your hand holding the mouse (the mouse is on your palm with the button upward). The mouse ball is released onto your palm.
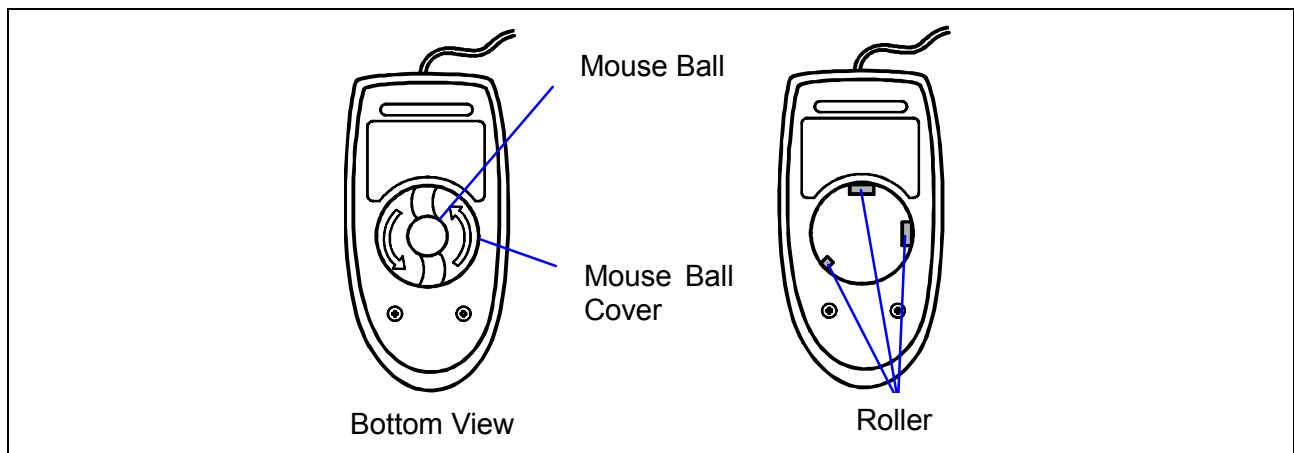
5.   Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.

6.   Rub off stains on the mouse ball. Softly wipe the mouse ball with the cloth prepared in Step 5.

7.   Wipe the mouse ball with a dry soft cloth.

8.   Wipe three small rollers inside the mouse with a cotton swab soaked with alcohol. Wipe stains slowly and carefully by rotating rollers with the tip of the cotton swab.

9.   Blow out any dust from the mouse. Protect your eyes from the dust.

10.   Put the mouse ball back into the mouse.

11.   Place the mouse ball cover, and rotate it clockwise until it is locked.

Cleaning CD-ROM

A dusty CD-ROM or dust-accumulated tray causes the device to fail to read data correctly.

Follow the procedure below to clean the tray and CD-ROM regularly:

1. Make sure that the server is powered (the POWER/SLEEP lamp is lit).

2. Press the Eject button on the front of the CD-ROM drive.
   The tray comes out.

3. Hold the CD-ROM lightly and take it out from the tray.

   NOTE: Do not touch the signal side of the CD-ROM with your hand.

4. Wipe the tray with a dry soft cloth.

   IMPORTANT: Do not wipe the lens of the CD-ROM drive. Doing so may damage the lens and may cause a malfunction of the drive.

5. Press the Eject button or gently push on the tray front to close the tray.

6. Wipe the signal side of the CD-ROM with a dry soft cloth.

   IMPORTANT: Wipe CD-ROMs from the center to the outside. Use only CD-ROM cleaner if necessary. Cleaning a CD-ROM with record spray/cleaner, benzene, or thinner causes damage to the CD-ROM contents. At worst, inserting the CD-ROM into the server may cause failure.
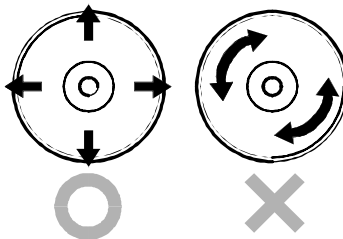
SYSTEM DIAGNOSTICS

The System Diagnostics runs several tests on the server.

Use the System Diagnostics program in the EXPRESSBUILDER provided with the server to diagnose the server.

Test Items

The following items are tested in system diagnostics.

- Memory
- CPU cache memory
- Hard disk used as a system
- On-board LAN controller

> **IMPORTANT:** When executing the system diagnosis, make sure to remove the LAN cable. Executing the system diagnosis with the LAN cable connected, the network may be influenced.

> **NOTE:** On checking the hard disk, no data is written into the disk.

Starting and Ending the System Diagnostics

There are two ways to diagnose the server: to use the local console (keyboard) of the server itself, and to use the management PC via serial port (remote console).

Procedures to start the diagnostic program is as follows:

> **IMPORTANT:** In the electronic "NEC EXPRESSBUILDER" User's Guide, you will find that both LAN and COM port can be used in remote console mode, however, in system diagnostics, only the COM port can be used.

1. Shutdown the OS, and turn off the server. Then, unplug the power cord.
2. Disconnect all the LAN cables from the server.
3. Plug the power cord and turn on the server.
4. Use the EXPRESSBUILDER CD-ROM to reboot the server.

   See the electronic "NEC EXPRESSBUILDER" User's Guide for details.

   The following menu appears when started the server using the EXPRESSBUILDER.
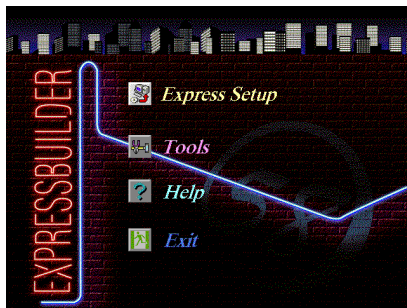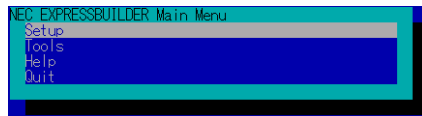
| Local console | Remote console |

5. Select [Tools].
6. Select [System Diagnostics].

   The system diagnostics starts and completes in approximately three minutes.
   When the diagnosis completes, the following appears on the screen of the display unit.
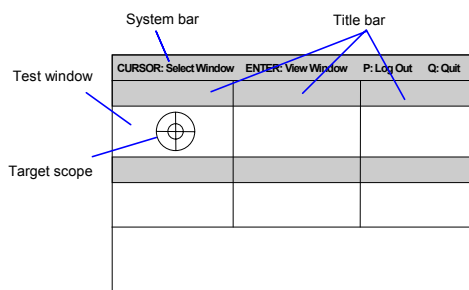
Screen showing diagnostic result (Local console)	Screen showing diagnostic result (Remote console)
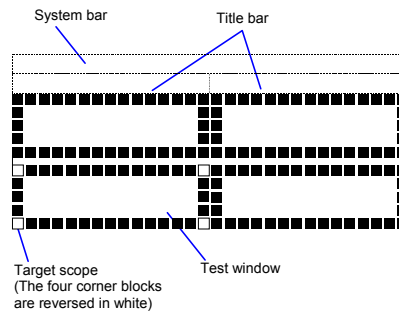
System bar: Shows information including time of progress during the diagnosis and descriptions on key operations to navigate the window upon completion of the diagnosis.

Title bar: Shows the diagnostic items. If an error is detected, the bar is indicated in red (local console), or flashing (remote console).

Test window: Shows the progress or result of diagnosis.

Target scope: Cursor to select the test window. Use the cursor keys on the keyboard to move it to another test window. (Move the target scope to a desired window and press **Enter**. Now you can view detailed information on the selected window. To return to the previous window, press **Enter** once again.)

> **IMPORTANT:** To select the test window in remote console, press keys as shown below.
>
> PageUp: **Ctrl** + **A**, PageDown: **Ctrl** + **Z**

If an error is detected during the system diagnosis, an error information is displayed as follows. Take a note on the error message and contact your sales agent.

Local console: The title bar turns in red, and error information is displayed in red characters.

Remote console: The test item indicated on the title bar flashes.

7. Press **Q** and select "Reboot" from the menu.

The server restarts and the system is launched from the EXPRESSBUILDER.

8. Exit the EXPRESSBUILDER, and remove the CD-ROM from the CD-ROM drive.

9. Turn off the server and unplug the power cord from the receptacle.

10. Reconnect all the LAN cables to the server.

11. Plug the power cord.

This completes the system diagnosis.

RELOCATING/STORING THE SERVER

Follow the procedure below to relocate or store the server:

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage.

- Never attempt to lift the server only by yourself.
- Do not install the server in any place other than specified.
- Do not connect/disconnect any interface cable with the power cord of the server plugged to a power source.

> **IMPORTANT:**
>
> - If the server needs to be relocated/stored due to a change in the floor layout to a great extent, contact the sales agent.
>
> - Make sure to make a backup copy of your valuable data in the hard disk, if any.
>
> - Make sure not to apply a shock to hard disks to relocated the server if the contains any.

1. Take a floppy disk and a CD-ROM out of the server, if any.

2. Power off the server (the POWER lamp goes off).

3. Disengage the power cord from the tie wrap.

4. Unplug the power cord of the server from a power outlet.

5. Remove all the cables from the server.

6. Remove the server from the rack cabinet.

   See Chapter 2 for details.

7. Hold the server by its bottom with at least another person to carry the server.

8. Protect the server with the shock-absorbing materials, and pack it securely.

Chapter 6

Troubleshooting

Read this chapter to obtain trouble-free operation of your server system.

> **NOTE:** To prevent problems with your system, it is recommended to install the maintenance utility, ESMPRO, on the server and client computers.

SYSTEM VIEWERS

Monitor ESMPRO fault occurrences during system operation.

Especially take note on whether any alert is reported to ESMPRO Manager on the Management PC. Check, whether any alert is reported on the Joint Operation Window Viewer, Data Viewer, or Alert Viewer of ESMPRO Manager.

[Example]

LAMPS

The server includes lamps to indicate the server states by a variety of colors and display patterns on the front panel, hard disk drive, and power supply.

Chapter 1 "Status Indicators" lists the lamp displays and their meanings and the actions taken at occurrences of failures.

ERROR MESSAGES

When an error occurs in the server, an error message appears on the display unit connected to the server.

Error Messages after Power-on

Powering on the server automatically starts the self-diagnostic program, POST (Power On Self-Test). When the POST detects any error, it displays an error message and its error code on the display unit.

Follow the table below to troubleshoot such errors. However, even when there is no hardware failure, use of the keyboard or mouse at the following events causes POST to assume a keyboard controller error and stop processing.

- Immediately after the server is powered

- Immediately after the system is rebooted in response to a keyboard instruction (simultaneous key entry of **Ctrl** + **Alt** + **Delete**)

- Immediately after the system is rebooted in response to an OS instruction

- During hardware initialization following restart of POST

When POST detects a hardware failure due to any of the above reasons, restart the server. If the same error message reappears, you may assume there is no hardware error. To ensure normal server operation make sure you follow the following restrictions.

- Do not make any keyboard entry or use the mouse before the memory size appears on the screen following the server power-on.

- Do not make any keyboard entry or use the mouse before the start-up message of the SCSI Configuration Utility appears on the screen following the server reboot.

> **IMPORTANT:** Note the on-screen message before contacting your service representative. The alarm indication is a great help for system maintenance.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. The following table lists error messages, descriptions, and actions to take.

> **IMPORTANT:** Note the messages displayed before consulting with your service representative. Alarm messages are useful information for maintenance of your system.

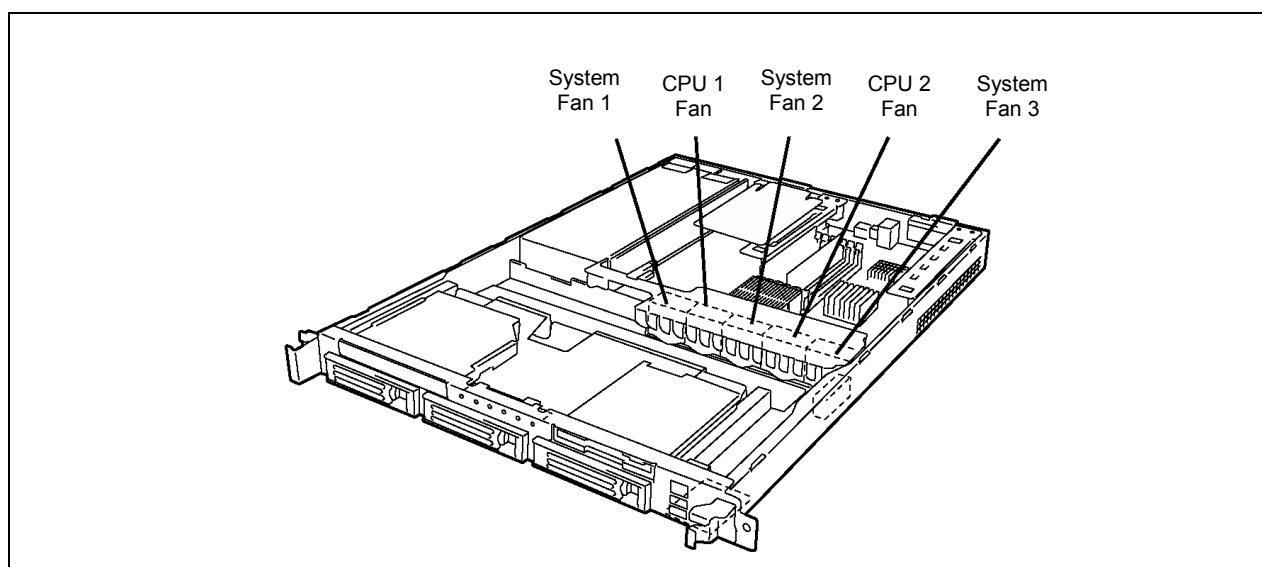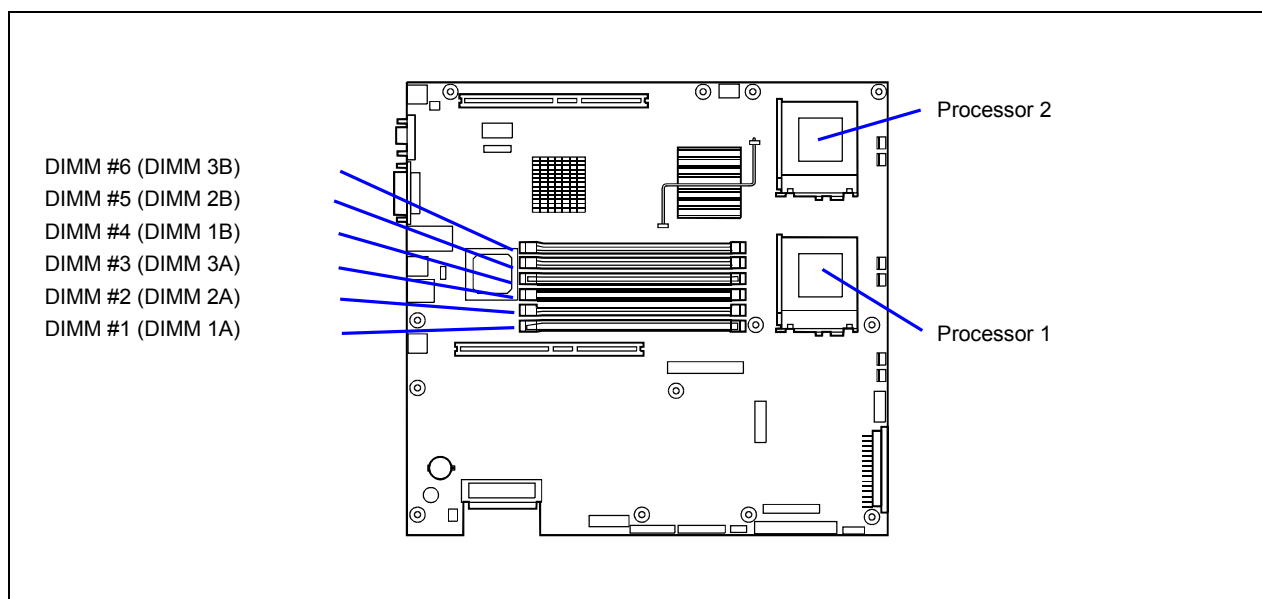| On-screen error message		Description	Action
100	Timer Channel 2 Error	Timer channel 2 error	Contact your service representative to replace the system board.
101	Master Interrupt Controller	IDE master interrupt error	
102	Slave Interrupt Controller	IDE slave interrupt error	
103	CMOS Battery Failure	System RAM error due to a battery failure. Offset address	
104	CMOS Option not Set	System CMOS setting error	Contact your service representative to replace the system board. (Restart the computer, and then execute SETUP to correct the setting.)
105	CMOS Checksum Failure	System CMOS checksum error	Execute SETUP to correct the setting.
106	CMOS Display Error	Display error	Contact your service representative to replace the system board.
107	Insert Key Pressed	**Insert** is pressed.	Release the key.
108	Keyboard Locked Message	The keyboard is locked.	Reconnect the keyboard.
109	Keyboard Stuck Key	A key is held down.	Release the key. Contact your service representative to replace the system board.
10A	Keyboard Interface Error	Keyboard interface error	Reconnect the keyboard. Contact your service representative to replace the system board.
10B	System Memory Size Error	System memory error	Install the DIMMs correctly. Check if all the installed DIMMs are under the same specification. Contact your service representative to replace the DIMMs.
10E	External Cache Failure	External cache error	Install the CPU (processor) correctly. Contact your service representative to replace the CPU.
110	Floppy Controller Error	Floppy disk controller error	Contact your service representative to replace the floppy disk drive or system board. This server does not support floppy disk drive B.
111	Floppy A: Error	Floppy disk drive A error	
112	Floppy B: Error	Floppy disk drive B error	

On-screen error message		Description	Action
113	Hard disk 0 Error	Hard disk error	Contact your service representative to replace the system board, SCSI back-plane, or hard disk.
114	Hard disk 1 Error		
115	Hard disk 2 Error	Hard disk error	Contact your service representative to replace the system board, SCSI back-plane, or hard disk.
116	Hard disk 3 Error		
117	CD-ROM disk 0 Error	CD-ROM disk error	Contact your service representative to replace the system board or the CD-ROM drive.
118	CD-ROM disk 1 Error		
119	CD-ROM disk 2 Error		
11A	CD-ROM disk 3 Error		
11B	Date/Time not set	The date and time are not set.	Activate the BIOS SETUP utility to set the date and time.
11E	Cache memory bad	Cache memory error	Install the CPU (processor) correctly. Contact your service representative to replace the CPU.
120	CMOS clear	The CMOS contents were cleared.	Activate the BIOS SETUP utility to set the CMOS or password.
121	Password clear	The password was cleared.	Contact your service representative to replace the system board.
140	PCI Error	PCI board error	Securely install the PCI boards and PCI riser card.
141	PCI Memory Allocation Error	PCI board memory allocation error	Contact your service representative to replace the PCI board, system board, or PCI riser card.
142	PCI IO Allocation Error	PCI board I/O allocation error	
143	PCI IRQ Allocation Error	PCI board interrupt error	Activate the BIOS SETUP utility to set the PCI board.
144	Shadow of PCI ROM Failed	PCI board shadow ROM error	Securely install the PCI boards and PCI riser card. Contact your service representative to replace the PCI board, system board, or PCI riser card.
145	PCI ROM not found	The expanded ROM on the PCI board cannot be detected.	Securely install the PCI boards and PCI riser card. Contact your service representative to replace the PCI board, system board, or PCI riser card.
146	Insufficient Memory to Shadow PCI ROM	The area for extending the expanded ROM on the PCI board is insufficient.	For PCI boards which do not need to be bootable, activate the BIOS SETUP utility to disable extension of the expanded ROM on the PCI board. Securely install the PCI boards and PCI riser card. Contact your service representative to replace the PCI board, system board, or PCI riser card.

On-screen error message	Description	Action
8100 Processor 1 failed BIST	Burst transfer error of processor 1	Securely install the processor. Contact your service representative to replace the processor or system board.
8101 Processor 2 failed BIST	Burst transfer error of processor 2	
8110 Processor 1 Internal error (IERR)	Internal error (IERR) of processor 1	
8111 Processor 2 Internal error (IERR)	Internal error (IERR) of processor 2	
8120 Processor 1 Thermal Trip error	Thermal trip error of processor 1	
8121 Processor 2 Thermal Trip error	Thermal trip error of processor 2	
8130 Processor 1 disabled	The processor [1, 2] was disabled due to an error.	Securely install the processor. Contact your service representative to replace the processor or system board.
8131 Processor 2 disabled		
8140 Processor 1 failed FRB-3 timer	The processor could not be initialized at booting, and a timeout occurred.	
8141 Processor 2 failed FRB-3 timer		
8150 Processor 1 failed initialization on last boot	Processor 1 could not be initialized at the previous booting.	Securely install the processor. If the message is displayed each time the system is booted, contact your service representative to replace the processor or system board.
8151 Processor 2 failed initialization on last boot	Processor 2 could not be initialized at the previous booting.	
8160 Processor 01: unable to apply BIOS update	The internal control code of the processor [1, 2] could not be applied.	Contact your service representative to replace the processor or system board.
8161 Processor 02: unable to apply BIOS update		
8170 Processor P1 :L2 cache failed	The second cache in the processor [1, 2] could not be initialized.	
8171 Processor P2 :L2 cache failed		
8180 BIOS does not support current stepping for Processor P1	A processor of an unsupported type is installed.	
8181 BIOS does not support current stepping for Processor P2		
8190 Watchdog Timer failed on last boot	A watchdog timer error occurred at the previous booting.	Securely install the processor. If the message is displayed each time the system is booted, contact your service representative to replace the processor or system board.
8191 4:1 Core to bus ratio: Processor Cache disabled	The cache of the processor was disabled.	
8192 L2 Cache size mismatch	The second cache in the processor does not match.	Install processors under the same specification.
8193 CPUID, Processor Stepping are different	The CPU ID or stepping does not match the value in the installed processor [1, 2].	

On-screen error message	Description	Action
8194 CPUID, Processor Family are different	The processor type does not match the value in the installed processor [1, 2].	
8195 Front Side Bus Speed mismatch. System Halted	The front side bus speed does not match the value in the installed processor [1, 2].	Securely install the processor. Contact your service representative to replace the processor or system board.
8196 Processor Model are different	The processor model does not match the value in the installed processor [1, 2].	Install processors under the same specification.
8197 CPU Speed mismatch	The processor clock speed does not match the value in the installed processor [1, 2].	
8300 Baseboard Management Controller failed to Function	The baseboard management controller does not function.	Contact your service representative to replace the system board.
8301 Front Panel Controller failed to Function	The front panel controller does not function.	
8305 Hotswap Controller failed to Function	The hot swap controller installed on the SCSI back-plane (HSBP) does not function.	
8420 Intelligent System Monitoring Chassis Opened	The top cover is not installed correctly.	Install the top cover correctly.
84F1 Intelligent System Monitoring Forced Shutdown	The system was forcibly shut down.	Confirm that the system starts normally. If the system is in abnormal state, contact your service representative to replace the system board.
84F2 Server Management Interface Failed	A server management interface failure occurred.	Contact your service representative to replace the system board.
84F3 BMC in Update Mode	The baseboard management controller is in update mode.	Ask your service representative for maintenance.
84F4 Sensor Data Record Empty	There is no sensor data record.	
84FF System Event Log Full	The event log is full.	Clear the event log by using the BIOS SETUP utility. If the error is not eliminated, contact your service representative to replace the system board. The error message is displayed periodically if ESMPRO is not installed. The event log must be cleared periodically.

The following figures show the location of specific components referenced in the POST Error Codes and Messages table.

DIMM #6 (DIMM 3B)
DIMM #5 (DIMM 2B)
DIMM #4 (DIMM 1B)
DIMM #3 (DIMM 3A)
DIMM #2 (DIMM 2A)
DIMM #1 (DIMM 1A)

Processor 2

Processor 1

System Fan 1   CPU 1 Fan   System Fan 2   CPU 2 Fan   System Fan 3

NOTE: Failed CPU or memory boards can be identified with the SETUP utility.

Beep Codes

If an error occurs during the POST, the server beeps, indicating the type of error.

Each number indicates the number of short beeps, and a hyphen indicates a pause. For example, the beep interval 1-5-2-2 indicates 1 beep, pause, 2 beeps, pause, 2 beeps, pause, and 3 beeps notifying that no processor is detected on the system board.

Beeps	Error	Recommended Action
1	Refresh timer error	Contact your service representative to replace the system board
2	Parity error	Check if the DIMM cards are mounted correctly. If the error still occurs when the check result is normal, contact your service representative to replace the DIMM card or system board.
3	Base memory failure	
4	System timer error	Contact your service representative to replace the system board.
5	Processor failure	Contact your service representative to replace the processor or system board.
6	Keyboard controller error	Check if the keyboard is connected correctly. Contact your service representative to replace the keyboard or system board.
7	Processor exception interrupt error	Contact your service representative to replace the processor or system board.
8	Display memory read/write error	Contact your service representative to replace the system board.
9	ROM checksum error	Contact your service representative to replace the system board.
10	Shutdown register error	
11	BIOS disabled	
1-5-1-1	FRB failure	Contact your service representative to replace the processor or system board.
1-5-2-1	Processor type error	Check if the type of the mounted processor is correct. If the error still occurs when the check result is normal, contact your service representative to replace the processor or system board.
1-5-2-2	Processor not detected	Check if the processor is mounted correctly. If the error still occurs when the check result is normal, contact your service representative to replace the processor or system board.
1-5-4-2	Power failure	Contact your service representative to replace the power supply unit, power jumper board, or system board.
1-5-4-3	Chip set control error	Contact your service representative to replace the system board.
1-5-4-4	Power control error	Contact your service representative to replace the power supply unit, power jumper board, or system board.

> **IMPORTANT:** The "Option ROM initialization error" may occur due to insufficient ROM expansion area when several PCI boards with BIOS were installed. In that case, disable the BIOS to secure the expansion ROM area by using the BIOS configuration menu of optional board, or start SETUP and select [Advanced] → [Option ROM] to disable the slot that does not require the BIOS expansion.

SOLVING PROBLEMS

When the server fails to operate as expected, see the following to find out your problem and follow the instruction given before asking for repair.

If the server still fails to operate successfully after solving your problem, take a note on the on-screen message and contact your sales agent.

Problems with the Server

No screen display appears with beep:

- Take note of the beep code pattern, and then take the appropriate action according to the table listed earlier in "Beep Codes".

Fail to power on the server:

- Is power being supplied to the server?
  - Check if the power cord is connected to a power outlet (or UPS) that meets the power specifications for the server.
  - Make sure to use the power cord provided with the server. Check the power cord for broken shield or bent plugs.
  - Make sure the power breaker for the connected power outlet is on.
  - If the power cord is plugged to a UPS, make sure the UPS is powered and it outputs power. See the manual that comes with the UPS for details.

    Power supply to the server may be linked with the connected UPS using the BIOS setup utility of the server.

    <Menu to check: [Server] - [After Power Failure]>
- Did you press the POWER switch?
  - Press the POWER switch on the front of the server to turn of the power (the POWER lamp lights).

Fail to power off the server:

- Is the POWER switch enabled?

  – Restart the server and start the BIOS setup utility.

    <Menu to check: [Security] - [Power Switch Inhibit]>

- Is the server running in the Secure Mode?

  – The POWER switch is disabled in the Secure Mode. (Forced shutdown is also not available.) To release the Secure Mode, enter the password specified with the BIOS setup utility.

POST fails to complete:

- Is the DIMM board installed?

  – At least two DIMM boards are required for operation.

- Is the memory size large?

  – The memory check may take a few seconds if the memory size is large. Wait for a while.

- Did you perform any keyboard or mouse operation immediately after you started the server?

  – If you perform any keyboard or mouse operation immediately after start-up, POST may accidentally detect a keyboard controller error and stops proceeding. In such a case, restart the server once again. Do not perform any keyboard or mouse operation until the BIOS start-up message appears when you restart the server.

- Does the server have contains appropriate memory boards or PCI devices?

  – Operation of the server with unauthorized devices is not guaranteed.

Fail to access to internal or external devices (or such devices fail to operate):

- Are cables properly connected?
  - Make sure that the interface cables and power cord are properly connected. Also make sure that the cables are connected in the correct order.

- Is the power-on order correct?
  - When the server has any external devices connected, power on the external devices first, then the server.

- Did you install drivers for connected optional devices?
  - Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.

- Is BIOS configuration correct?
  - When the server has PCI devices connected, make sure to set the PCI device interrupt and others with the BIOS setup utility of the server. (Most PCI devices generally do not require any change to the configuration, but some boards do require specific settings. Refer to the manual that comes with the board for details to make correct settings.

    <Menus to check: [Advanced] - [PCI Configuration] - [PCI Slot xx ROM]
     x: PCI slot number>
  - Some devices connected to the serial or parallel port may require I/O port address or operation mode settings. Refer to the manual that comes with the board for details to make correct settings.

    <Menu to check: [Advanced] - [Peripheral Configuration]>

The DUMP and SLEEP switches are disabled:

- Is the server in the Secure Mode?
  - In the Secure Mode, the DUMP switch is disabled. To release the Secure Mode, enter the password specified with the BIOS setup utility.

The keyboard or mouse fails to operate:

- Is the cable properly connected?

  – You must use the provided keyboard/mouse branch cable (Y cable) for this server. Make sure that the provided cable is connected to the correct connector on the rear of the server.

  – The keyboard or mouse does not operate if it is connected when the server is powered (not applicable to USB devices). Power of the server first and connect it properly.

- Is BIOS configuration correct?

  – The keyboard and mouse may be disabled with the BIOS setup utility of the server. Check the settings with the BIOS setup utility.

    <Menus to check: [Advanced] - [Numlock]>

- Are the server drivers installed?

  – Refer to the manual that comes with your OS to check that the keyboard and mouse drivers are installed. (These drivers are installed along with the OS.) Some OS's allow you to change the keyboard and mouse settings. Refer to manual that comes with your OS to check that the keyboard and mouse settings are correct.

- Is the server in the Secure Mode?

  – In the Secure Mode, the keyboard and mouse are disabled. To release the Secure Mode, enter the password specified with the BIOS setup utility.

The following message appears on system log of event viewer while installing Windows 2000:

An error was detected on device \Device\CdRom0 in paging operation.

  – There is no problem on this issue.

Fail to access (read or write) to the floppy disk:

- Does the floppy disk drive contain a floppy disk?
  - Insert a floppy disk into the floppy disk drive until it clicks.
- Is the floppy disk write-protected?
  - Place the write-protect switch on the floppy disk to the "Write-enabled" position.
- Is the floppy disk formatted?
  - Use a formatted floppy disk or format the floppy disk in the floppy disk drive. Refer to the manual that comes with the OS for formatting a floppy disk.
- Is BIOS configuration correct?
  - The floppy disk drive may be disabled with the BIOS setup utility of the server. Check the setting with the BIOS setup utility.

    <Menus to check:
    [Main] - [Floppy A]
    [Advanced] - [Peripheral] - [Diskette Write Protect]
    [Advanced] - [Peripheral] - [Diskette Controller]>
- Is the server in the Secure Mode?
  - In the Secure Mode, write access to the floppy disk may be disabled. To release the Secure Mode, enter the password specified with the BIOS setup utility.

Fail to access to the CD-ROM:

- Is the CD-ROM properly set in the CD-ROM drive tray?
  - The tray is provided with a holder to secure the CD-ROM. Make sure that the CD-ROM is placed properly in the holder.
- Is the CD-ROM applicable to the server?
  - The CD-ROM for Macintosh is not available for use.

Inserted the correct CD-ROM but the message like the following is displayed:

```
The CD-ROM is not inserted or the wrong CD-ROM is inserted.
Please insert the correct CD-ROM.
OK
```

- Is the data side of the CD-ROM dirty or injured?
  - Take the CD-ROM out of the CD-ROM drive, confirm that it is not dirty or injured, reset and click [OK].

Fail to access the hard disk:

(Refer to the documentation supplied with the disk array controller.)

- Is the hard disk applicable to the server?

  – Operation of any device that is not authorized by NEC is not guaranteed.

- Is the hard disk properly installed?

  – Make sure to lock the hard disk with the lever on its handle. The hard disk is not connected to the internal connector when it is not completely installed (see Chapter 8).

Fail to access the (internal or external) SCSI devices:

- Is the SCSI device applicable to the server?

  – Operation of any SCSI device that is not authorized by NEC is not guaranteed.

- Are SCSI devices properly configured?

  – When the server has external SCSI devices connected, hard disk settings, including SCSI ID and terminator, are required. Refer to the manual that comes with the SCSI device for details.

- Are the SCSI controllers (including optional controllers) properly configured?

  – Use the BIOS setup utility for proper configuration of SCSI devices connected to the SCSI connector on the system board. When the server has an optional SCSI controller installed and SCSI devices connected to it, use the BIOS setup utility that comes with the optional SCSI controller for proper configuration. See the manual that comes with the optional SCSI controller for details.

Cannot install the operating system correctly.

- Did you confirm the notes on installing the operating system?

  – See Chapter 3.

During Windows 2000 installation, the following warning is registered in the System Log of the Event Viewer:

> Error detected on the device \Device\CdRom0 during the paging operation.

  – There is no problem on this issue.

Fail to start the OS:

- Is a floppy disk in the floppy disk drive?

    – Take out the floppy disk and restart the server.

- Is the EXPRESSBUILDER CD-ROM in the CD-ROM drive?

    – Take out the EXPRESSBUILDER CD-ROM and restart the server.

- Is the OS broken?

    – Use recovery process to recover the system. (See "Recovery for Windows 2000/Windows NT System" in this Chapter.)

The event log after every logon to Windows 2000 includes the following error log:

```
Description (D)
The CPUs in this multiprocessor system are not all the same revision level.
To use all processors the operating system restricts itself to the features of
the least capable processor in the system. Should problems occur with
this system, contact the CPU manufacture to see if this mix of processors
is supported.
```

- Has the CPU been expanded?

    – If the different revision (stepping) of the processor is installed in the multiprocessor system, Windows 2000 logs the above information every startup. If this message is logged, it is no problem for operation.

The OS presents unstable operation <Windows 2000/Windows NT>:

- Did you update the system?

    – Installing a network drive after installation of the OS may cause unstable operation. Use the EXPRESSBUILDER CD-ROM to update the system.

When any trouble occurred, the system does not run according to the specification of "Restart automatically" <Windows 2000>:

- When any trouble occurred on Windows 2000, the system may not restart automatically even if "Restart automatically" is specified. In such case, restart the system manually.

Cannot turn the power OFF at the blue screen <Windows 2000>:

- If you want to turn off the power at the blue screen, execute forced power off (forced shut down: continue to press POWER switch for 4 seconds). The power will not be turned off if you press the switch just one time.

An error log is included in the event log after log-on <Windows NT 4.0>:

Description (D) Crash dump is not available for use. Windows NT could not initialize the page file for the boot partition in response to the crash dump request. The system may have physical memory of 3.8 GB or more.

- Is additional memory installed?

  – When you installed additional memory, you need to increase the paging file size.

  Change the paging file size appropriate to the installed memory.

  Add 12MB to the real memory and specify the value for the paging file size.

  Double-click on [System] in the Control Panel and click on [Performance]. Click on [Change] for [Virtual Memory].

  Change the initialization and maximum sizes and click on [Change].

  Make sure to restart the system.

  > **NOTE:** See "Installing and Using Utilities" on the EXPRESSBUILDER CD-ROM for changing the paging file size on Windows 2000 system.

The OS presents unstable operation <NetWare>:

- When the system presents an error, refer to other manuals to check the configuration for any errors.

  Novell Inc. regularly releases update modules that include patch programs for solving problems. Before placing the system in service, consult with your NetWare dealer and use a module with the latest time stamp if no suggestions are provided. (It is recommended to update the module on a regular basis.)

  If the configuration is correct but an error keeps occurring with the latest module, contact your sale agent.

The server is not found on the network:

- Is the LAN cable connected?

  – Make sure to connect the LAN cable to the network port on the rear of the server. Also make sure that the LAN cable to use conforms with the network interface standard.

- Is BIOS configuration correct?

  – The internal LAN controller may be disabled with the BIOS setup utility of the server. Check the setting with the BIOS setup utility.

    <Menus to check:

    [Advanced] - [PCI Configuration] - [Onboard NIC 1], [Onboard NIC 2]>

- Have the protocol and service already configured?

  – Install the distinctive network driver for the server. Make sure that the protocol, such as TCP/IP, and services are properly specified.

- Is the transfer speed correct?

  – The internal LAN controller installed in the server in the standard configuration supports the transfer speed of 100 Mbps and 10 Mbps. This transfer speed may be selected or changed on the OS. However, do not specify "Auto Sense". Specify a specific speed, "100" or "10", instead.

- Have you update the system ? <Windows NT>

  – If the network driver is installed after the OS installation has completed, you must update the system to enable the function.

Problems with EXPRESSBUILDER

When the server is not booted from the EXPRESSBUILDER CD-ROM, check the following:

- Did you set the EXPRESSBUILDER during POST and restart the server?
  - If you do not set the EXPRESSBUILDER during POST and restart the server, an error message will appear or the OS will boot.
- Is BIOS configuration correct?
  - The boot device order may be specified with the BIOS setup utility of the server. Use the BIOS setup utility to change the boot device order to boot the system from the CD-ROM drive first.

    <Menu to check: [Boot]>
- Is an error message appeared?
  - When an error occurs while the EXPRESSBUILDER is in progress, the following message appears.

```
Error occurred.
Error code [XX]
Terminate the program.

Confirm:[Enter]
```

After this message appears, check the error and take the appropriate corrective action according to the error code listed in the table below.

Error code	Cause and Remedy
MC	This EXRESSBUILDER version is not designed for this server. Execute the EXPRESSBUILDER on the compliant server.
NV	An access to the nonvolatile memory (NvRAM) is not acceptable.
PT	The hard disk is not connected or it is failed. Check whether the hard disk is correctly connected.
FL	Read from and write to the floppy disk may be disabled. Replace the floppy disk with new one and execute EXPRESSBUILDER again.

Problems with Express Setup

<For Windows 2000/Windows NT 4.0 Common>

Following message appeared when you tried to install Express Setup to the hard disk that has smaller capacity than the specified partition size:

```
The specified partition size has exceeded the capacity of the hard disk.
The setup created the partition at the maximum size that can be reserved on the hard disk.
Setup will continue the process.
OK
```

- It is not an abnormal condition. Press **Enter** to continue the installation.

Following message appeared when copying the files from CD-ROM:

```
xxxxx : Not Ready xxxxxxxxxxxxxxxxZ
xxxxx(A),  xxxxx(R), xxxxx(F)
```

- Press **R**. When the message appears again even if you press **R**, restart the Express Setup from the beginning. In case the same result occurred after the restart of installation, contact Maintenance Service Company and ask them to check the CD-ROM drive.

Express Setup terminated and asks to input setup information.

- There are some errors on the specified setup information.
  Follow the instruction to input the correct value. It is not necessary to cancel the installation. On Windows 2000, you might be asked to press Enter again after the last reboot of the setup.

[Complete] appears on the [Role of Computer] screen.

- If you click [Complete] here, the setup will select the default value of Express Setup for the later specification to continue the process.

  <The Default Value for Windows 2000>

  ```
  The specification of network protocol
        Protocol :        TCP/IP[DHCP Specified]
        Service :         Select sharing Microsoft network files and printer.
        Client :          Microsoft network client.
        Component :       SNMP, IIS (Excluding Professional)
   Application :          ESMPRO Agent
                          Express Report Service
                          GAM Server (When connecting Mylex DAC)
                          GAM Client (When connecting Mylex DAC)
                          * DAC: Disk Array Controller
  ```

<The Default Value for Windows NT 4.0>

The specification of network
Adapter :	Standard network adapter
Protocol :	TCP/IP[DHCP specified]
Service :	SNMP, IIS(Excluding Workstation)
Application :	ESMPRO Agent
	Express Report Service
	GAM Server (When connecting Mylex DAC)
	GAM Client (When connecting Mylex DAC)
	* DAC: Disk Array Controller

[Complete] does not appear on [Role of Computer] screen.

- The [Complete] does not appear if the setup information file that has already been created is loaded.

- [Complete] appears only when you first entered the [Role of Computer] screen.
  Once you go to the next screen from [Role of Computer], the [Complete] will not appear even if you enter [Back] to go back to the [Role of Computer] screen.

Select [Use Existing Array] at [New/Existing RAID Configuration], but the OS is installed in the whole area of the disk.

- Is there any other partition than the partition to re-use (excluding maintenance area)? If the partition other than the one to re-use does not exist, the setup will reserve the whole area of the disk to install Windows 2000 or Windows NT 4.0.

<For Windows 2000>

Specified to join the Domain, but the system is installed as Workgroup.

- When the setup fails to join the Domain during the installation, it will install the system as Workgroup. Open [System] in Control Panel to specify joining the Domain.

Specified large value as partition size, but when Windows 2000 is actually started, the system partition is created by 2000MB.

- Is the [Partition Size] specified by the value larger than the real area? If you want to create one partition in all area of the hard disk(excluding the maintenance area) to install the OS, specify [All Area].

Windows 2000 started with different display resolution from the specified value.

- If the specified display resolution can not be used, the system will use the nearest value or the default value of the driver.

Entered the incorrect Product ID/CD key.

- Even if you entered the incorrect Product ID/CD key, Express Setup will start. However, the setup will stop and asks you to re-enter the correct value. Also in this case, input request will occur when rebooting after GUI setup completed during Express Setup. If these 2 inputs are done correctly, there is no problem on Windows 2000 setup.

Unable to specify the details of Network adapter.

- In Express Setup, you can not specify the details of Network adapter. Specify them from Control Panel after starting Windows 2000.

Windows 2000 is started with Network adapter that has not been specified during Express Setup

- Windows 2000 will install the recognized Network adapter specified as default value. If you want to modify the specification, it can be done from Control Panel after starting Windows 2000. Also, the Network adapter that has been specified during Express Setup but that is not connected will not be setup, though the protocol will only be installed.

Connected more than two Network adapter and specified different protocol for each adapter, but all the protocols are specified on either adapter.

- It's a design. Each adapter is specified so that all the installed protocols can be used. The value that can not be specified during Express Setup will all be specified by default value.

When more than two Network adapter are specified, the detailed specification of TCP/IP protocol are all set to use DHCP.

- When more than two Network adapter are specified, the detailed specification of the protocol may all be set by default value. Re-specify the details from Control Panel.

Not more than two Network adapter is connected, but the detailed specification of the protocol are all set by default.(e.g. Specified IP Address on TCP/IP, but DHCP is specified)

- Are you specifying more than two protocols?
  In this case, the situation will be the same as connecting more than two Network adapter, so the detailed specification of the protocol are all set by default.
  Re-specify the details from Control Panel after starting the OS.

<for Windows NT4.0>

Error message appeared during the installation, and ESMPRO Agent and IIS(Internet Information Server) can not be installed.

- Install ESMPRO Agent and IIS after completing the installation of Windows NT 4.0.

More than one network boards are connected by the specification of setup information, but TCP/IP can not be specified for each network adapter.

- Install with DHCP specified. In case you set formal IP configuration, first install with DHCP specified and re-specify the value from Control Panel after the installation.

Connected more than two network boards and installed network drivers, but only one network board is normally working after starting Windows NT 4.0.

- Modify the specification of network adapter from Control Panel.

Following message appeared during the installation:

```
Lacking the quarter of system registry.
To increase the registry quarter, run [System] in Control Panel and click [Virtual Memory].
```

- After logging on, follow the message to modify the value of registry quarter.

Backup Domain Controller of Primary Domain Controller that has exceeded the router.

- Express Setup can not create Primary Domain Controller that has exceeded the router. Re-install it by manual setup.

Unable to join the domain on the Primary Domain Controller that has exceeded the router.

- On Express Setup, you can not join the domain on the Primary Domain Controller that has exceeded the router. Install the system as Workgroup and join the domain from Control Panel after starting the OS.

Unable to uninstall Service Pack.

- Are you creating the partition to installed the OS with the size larger than 4GB?
  - To install Windows NT 4.0 on the partition larger than 4GB, Service Pack modules are necessary. In this case, you can not uninstall Service Pack even after starting Windows NT 4.0.

Unable to create the partition size larger than 4GB.

- Aren't you missing to input setup information?
  - Be sure to input [Company Name] on [User Information] screen.

Following message may appear on [explorer.exe] dialog box during the installation:

> This Windows application can not respond to [End the Application].
> It may be busy, waiting for the response from the user,
> or terminating the execution.

- There is no problem about this issue.
  - Click [End the Application] and continue Express Setup.

Error Message during Disk Array Configuration

Refer to the manual that comes with the disk array controller for any trouble on the disk array in this system.

Problems with Master Control Menu

The master control menu fails to appear:

- Is your system Windows NT 4.0 or later, or Windows 95 or later?
  - The CD-ROM Autorun feature is supported by Windows NT 4.0 and Windows 95. The older versions do not automatically start from the CD-ROM.
- Is **Shift** pressed?
  - Setting the CD-ROM with **Shift** pressed down cancels the Autorun feature.
- Is the system in the proper state?
  - The menu may not appear depending on the system registry setting or the timing to set the CD-ROM. In such a case, start the Explorer and run \MC\1ST.EXE in the CD-ROM.

Problems with Configuration Diskette Creator

<Common to Windows 2000/Windows NT 4.0>

The bit map of the Configuration Diskette Creator window is not displayed correctly during setting of setup information.

- If the specified number of colors is fewer than 256 in the display setting, the bit map is not displayed correctly, but the setup information can be displayed correctly.

<Windows 2000>

The Point to Point tunneling protocol cannot be set.

- The protocol is not supported at present. After installation, set the protocol through Control Panel. In this case, rebooting is not necessary.

The details of a network adapter cannot be set.

- Configuration Diskette Creator is unable to set the details of network adapters. Start Windows 2000, and set the details through Control Panel.

<Windows NT 4.0>

Resolution cannot be set during setting of setup information.

- When completing installation of Windows NT 4.0, set resolution through Control Panel.

More than one network board is connected during setting of setup information, but TCP/IP cannot be set for each network.

- Perform the installation procedure during DHCP setting. To create a temporary IP configuration, perform the installation procedure during DHCP setting, and then set TCP/IP again through Control Panel.

COLLECTING EVENT LOG

This section describes on how to collect the log of various events that occurred on the server.

> **IMPORTANT:** If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

Windows 2000

> **NOTE:** The different revision processor may be mixed in additional CPU kit. When Windows 2000 is used, following message may be appeared in the System Log of the Event Viewer after extension the different revision of two or more CPUs in the Express server. If this message is logged, it is no problem for operation.
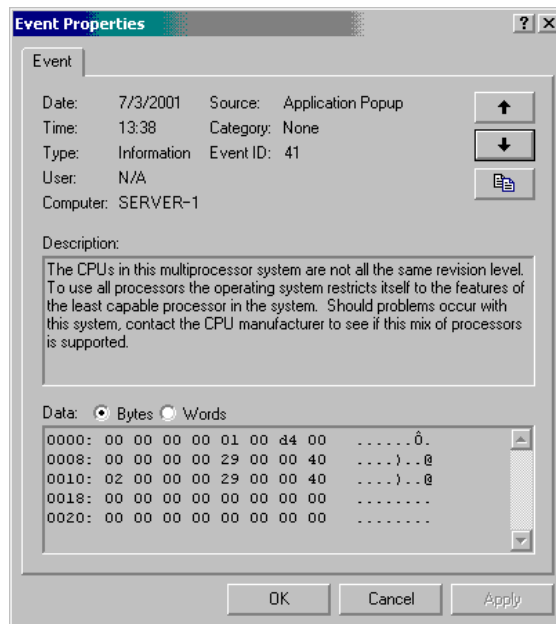
1. Click [Management Tool] → [Event Viewer] from the Control Panel.

2. Select the type of the log to collect.

   On [Application Log], the events related to the running application is archived. On [Security Log], the events related to the security is archived. On [System Log], the events occurred at the item which configures Windows 2000 system is archived.

3. Click [Save as...] in the [Run] menu.

4. Input the file name of archived log in the [File Name] box.

5. Select the type of the log file you want to save in the [File Type] list box and click [OK].

For more information, refer to Windows 2000 Online Help.

Windows NT 4.0

1. Click [Program] → [Management Tool] → [Event Viewer] from the Start pop-up menu.

2. Select the type of log you want to collect from the [Log] menu.

   On [System], the events occurred at the item that configures Windows NT 4.0 system is archived. On [Security Log], the events related to the security is archived. On [Application Log], the events related to the running application is archived.

3. Click [Save as...] in the [Operation] menu.

4. Input the file name of archived log in the [File Name] box.

5. Select the type of the log file you want to save in the [File Type] list box and click [OK].

For more information, refer to Windows NT 4.0 Online Help.

COLLECT CONFIGURATION INFORMATION

This section describes on how to collect the information on hardware configuration and inside specification.

In order to collect information, "Diagnostic Program" is used.

> **IMPORTANT:** If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

Windows 2000

1. Point to [Settings] in Start menu, and click [Control Panel].

    The [Control Panel] dialog box appears.

2. Double-click [Management Tool], and double-click [Computer Management].

    The [Computer Management] dialog box appears.

3. Click [System Tool] → [System Information].

4. Click [Save as System Information File] in the [Operation] menu.

5. Input the file name to save in the [File Name] box.

6. Click [Save].

Windows NT 4.0

1. Click [Program] → [Management Tool] → [Windows Diagnostic Tool] from the Start pop-up menu.

2. Click [Save the Report] in the [File] menu.

3. Specify the details of the report you want to create.

    Specify [Range] as [All Tabs].
    Specify [Detailed Level] as [Perfect].
    Specify [Output Location] as [File].

4. Input the file name to save in the [File Name] box.

5. Click [OK].

COLLECTING DR. WATSON DIAGNOSTIC INFORMATION

Dr. Watson collects diagnostic information related to application errors. The location to save the information can be specified as you like. For more information, refer to Chapter 5 (The instruction is described for Windows 2000 and Windows NT 4.0 separately.)

MEMORY DUMP

If an error occurs, the dump file should be saved to acquire necessary information.

If you saved the dump to DAT, write down that it is saved as "NTBackup" or "ARCServe" on the label. You can specify the location to save the diagnostic information as you like.. For more information, refer to "Specifying Memory Dump (Debug Information (refer to Chapter 5 for detail)".

IMPORTANT:

■ Consult with your sales agent before dumping the memory. Dumping the memory while the server is in the successful operation may affect the system operation.

■ Restarting the system due to an error may display a message indicating insufficient virtual memory. Ignore this message and proceed. Restarting the system may result in dumping improper data.

PREPARING FOR MEMORY DUMPING

Memory dumping with the DUMP switch may disable the server to restart. In such a case, it is required to force the server to shut down. This forced shutdown, however, is not available if "Enable" is selected for "Power Switch Inhibit" on the Security menu of the BIOS setup utility, SETUP, because this setting disables POWER switch operation.

Follow the procedure below to change the setting to enable the forced shutdown and restart of the server.

1. Power on the server and start the BIOS setup utility, SETUP.

2. Select "Disable" for "Power Switch Inhibit" in the Security menu.

3. Save the configuration data and exit the SETUP.

Saving the Dump File

Press the DUMP switch to save the dump file when an error occurs. Insert a metal pin (a straightened large paper clip will make a substitute) into the switch hole to press the DUMP switch.
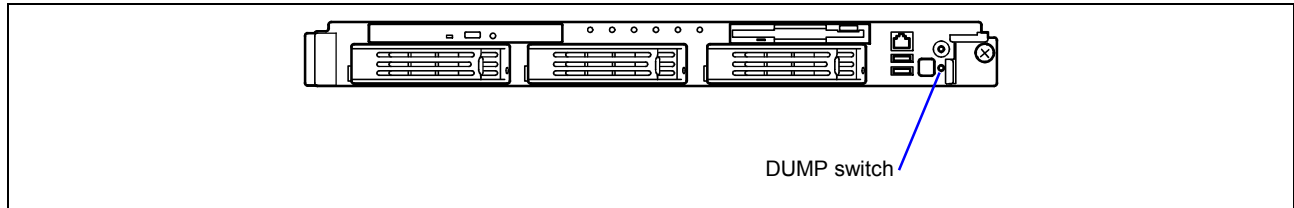
DUMP switch

Pressing the DUMP switch saves the dump file in the specified directory. (Memory dumping may not be available when the CPU stalls.)

> **IMPORTANT:** Do not use a toothpick or plastic stick that is easy to break.
> Do not use any pin easily broken such as a toothpick or plastic pin. Use a
> pin having the length of 1 inch (25 mm) or longer.
>
>
>
> 25 mm or longer
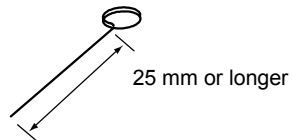
Backup IPMI Information

This section describes on how to collect IPMI information. To collect the information, ESMPRO
Agent must be installed.

   1.   Select [Program] → [ESMPRO Agent] → [ESRAS Utility] from the Start pop-up menu.

       The [ESRAS Utility] window appears.

   2.   Select [Latest Information] from the Tree View to collect the information of local
computer.

       If the data is displayed, it means the data is collected normally.

   3.   Click [Backup Current IPMI Information] from the [File] menu.

   4.   Confirm the computer name to backup the information.

   5.   Specify the backup file name to save and the location to save it, and click [Backup].

RECOVERY FOR Windows 2000/Windows NT SYSTEM

If any file necessary for running the OS is damaged, use the following procedures to recover the system.

IMPORTANT:

- After recovering the system, see "Updating the System" in Chapter 4 and be sure to update the system.
  Also on Windows 2000, you need to update all the drivers after the system update. For more information, see "Installing and Setting Device Drivers" in Chapter 4.

- Concerning Windows NT 4.0, in case you updated the system, be sure to update the recovery information also which will be the base of system recovery. (For more information on how to update the recovery information, see "Updating System Recovery Information" in Chapter 4.)
  Concerning Windows 2000, see "Installing and Setting Device Drivers" and "Updating the System" in Chapter 4 and be sure to update both the drivers and the system.

- If the hard disk can not be recognized, you can not recover the system.

Recovery Procedure - Windows 2000 -

Follow the procedure below and use the information in the disk, not system recovery disk, to recover the system.

1. Turn on the power of the system.

2. Insert Windows 2000 CD- ROM into the CD-ROM drive of your server.

3. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot the server. (You may also turn the server off and on to reboot the server.)

4. <When no disk array controller is installed in the system>

   Proceed to step 8 according to instructions on the screen.

   <When Mylex RAID board is installed>

   Press **F6** while the message "Setup is inspecting your computer's hardware configuration..." is displayed at the upper part of the screen.

   NOTE: Nothing is changed on the screen through **F6** is pressed.
   ---

5. Press **S** when the following message appears:

> Setup could not determine the type of one or more mass storage devices installed in your
> system, or you have chosen to manually specify an adapter.
> Currently, Setup will load support for the following mass storage devices.

Select [Other] and press **Enter**.

6. Insert Windows 2000 OEM-DISK for EXPRESSBUILDER into the floppy disk drive and press Enter.

> Please inset the disk labeled
> manufacturer-supplied hardware support disk
> into Drive A:
> * Press ENTER when ready.

7. Select the proper SCSI Adapter and press **Enter**.

- Mylex AcceleRAID 160 Disk Array Controller (When N8103-52F board is installed.)

- Mylex AcceleRAID 352 Disk Array Controller (When N8103-53AF board is installed.)

8. Press **R** to select the recovery option.

9. Select the keyboard.

10. If you are requested, press **R** to select system recovery procedure.

11. If you are requested, select either of the procedure below:

[Manual Recovery] (Press **M**)

> Do not select this option unless you are a high-level user or a system administrator. If you use this option, you can recover the problems of system files, partition boot sector, and start-up environment.

[Quick Recovery] (Press **F**)

> This option is very easy to use and the user does not need to do anything during the procedure. If you select this option, the system recovery disk program starts to recover the problems concerning system files, partition boot sector of system disk, and start-up environment (if multiple operating systems are installed on the system).

12. Follow the instruction displayed on the screen, and then press **L** at the screen which request you to insert system recovery disk. The system will be restarted once.

> **NOTE:** Starts the procedure without system recovery disk.

13. Repeat steps 1 to 10.

The recovery procedure will be started.

During the recovery, the missing files and the damaged files are replaced either to the files in C:\ I386 folder of hard disk or the files in systemroot\ Repair of the system partition. These replaced files do not reflect the changes of the configuration after the setup at all.

14. Follow the instruction displayed on the screen.

If you take a note of any file name in which trouble is detected during the procedure, it is useful to diagnose how the system has been damaged.

15. Terminates the procedure if the recovery is successful.

You can verify that the replaced files are correctly copied to the hard disk if the computer is restarted normally.

Recovery Procedure - Windows NT 4.0 -

If you are using Windows NT 4.0, follow the procedure below to recover the system.

System Recovery

Follow the procedure below and use the information in the disk, not system recovery disk, to recover the system.

1. Turn on the power of the system.

2. Insert Windows NT 4.0 CD- ROM into the CD-ROM drive of your server.
    Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)

3. After turning the system power on, press **F6** at either of the following situation:

    ■ The message "Setup is inspecting your computer's hardware configuration..." is being displayed.

    ■ The whole blue screen is being displayed.

    The message "Setup could not detect more than one mass storage driver which is installed in the system." and the input requesting screen will appear.

    If the input requesting screen does not appear, **F6** is not pressed correctly. Press **F3** to exit the setup and turn on the system power once again to start the setup.

4. Press **S**.

5. Select [Others] and press **Enter**.

6. Insert Windows NT 4.0 OEM-DISK for EXPRESSBUILDER #1 into the floppy disk drive and press Enter.

7. Select [Adaptec Ultra 160/m Family PCI SCSI Controller] and press **Enter**.

    The screen will go back to step 5.

8. If the disk array controllers are mounted on the device, repeat the steps 5 to 7 and select [Mylex AcceleRAID 160/352 Disk Array Controller].

    Follow the message displayed on the screen until [Welcome to Setup] screen appears.

9. Press **R** to select recovery option.

10. Select the task to execute and continue the procedure.

11. Follow the message and press Enter on the screen which request you to insert system recovery disk.

    The message "Windows NT is detected in the following directory on your hard disk." will appear.

12. Press **Enter**.

13. If the message asking whether or not select the hard disk inspection appears, press **Esc**.

14. Select the registry file to recover and continue the procedure.

15. Press **A**, and recover all the non-original files.

16. Follow the message and continue the procedure.

If the recovery is successful, the procedure will be terminated.

You can verify that the replaced files are correctly copied to the hard disk if the computer is restarted normally.

> **IMPORTANT:** The following message may appear during system recovery. In that case, press **Esc** and cancel the procedure. Concerning the recovery of network driver, follow "Network-related Recovery".

> Insert the following disk into drive A:
> Intel PRO Adapter CD- ROM or floppy disk
> *Press Enter key if you are ready.

Network-related Recovery

Follow the procedure below to recover network driver.

1. Click [Start] → [Settings] → [Control Panel].

The Control Panel window appears.

2. Double-click [Network].

The [Network] window appears.

3. Click [Adapter].

4. Select the network adapters you need from network adapter list displayed on the [Network Adapter], and click on [New].

5. Set the disk which includes network driver.

6. Enter the pass for network driver directory, and click on [Continue].

OFF-LINE MAINTENANCE UTILITY

The Off-line Maintenance Utility is an OS-independent maintenance program. When you are unable to start the OS-dependent ESMPRO to troubleshoot a problem, the Off-line Maintenance Utility can be used.

IMPORTANT:

- The Off-line Maintenance Utility is intended for use of your sales agent. The EXPRESSBUILDER CD-ROM and the Off-line Maintenance Utility Bootable FD you have created contain a file that describes operation of the utility, but do not attempt to use the utility by yourself. Contact your sales agent and follow instructions.

- Starting the Off-line Maintenance Utility disables any access from a client to the server.

Starting the Off-line Maintenance Utility

The Off-line Maintenance Utility may be started in many ways.

> **IMPORTANT:** Do not start the Off-line Maintenance Utility while the server is in successful operation.

- From the CD-ROM

  Set the EXPRESSBUILDER CD-ROM in the CD-ROM drive and reboot the system.

  After the menu is displayed on the screen, select "Tools" - "Off-line Maintenance Utility".

  The Off-line Maintenance Utility program starts from the CD-ROM.

- From the floppy disk

  Set the Off-line Maintenance Utility Bootable FD in the floppy disk drive and reboot the system.

  The Off-line Maintenance Utility program starts from the boot disk.

  The Off-line Maintenance Utility Bootable FD is created by selecting "Tools" - "Create Support FD" on the EXPRESSBUILDER.

- Manual start (by pressing **F4**)

  When the Off-line Maintenance Utility is installed, press **F4** while the start-up screen of the server is on screen. The Off-line Maintenance Utility starts from the hard disk.

Features of Off-line Maintenance Utility

The Off-line Maintenance Utility provides the following features. (Available features vary depending on the way you started the Off-line Maintenance Utility.)

> **IMPORTANT:** See the on-line help for details of the Off-line Maintenance Utility. For further information, ask your sales agent.

- IPMI Information Viewer

  Provides the functions to view the system event log (SEL), sensor data record (SDR), and field replaceable unit (FRU) and to make a backup copy of them.

  Using this feature, you can find system errors and events to determine a maintenance part.

- BIOS Setup Viewer

  Provides the functions to export the current configuration data defined with the SETUP utility to a text file.

- System Information Viewer

  Provides the functions to view information on the processor and the BIOS and export it to a text file.

- System Information Management

  Provides the function to make a back-up copy of you data.

  Without the backup data, the system-specific information and/or configuration may not be restored.

  Only the authorized personnel is allowed to restore the backup data.

- Start of Utilities

  With the EXPRESSBUILDER, you can start the following utilities installed in the maintenance partition.

  – System Management function

  – System Diagnostics

  – Maintenance Partition Update

- Chassis Identify

  The lamp on the front panel is flashed for five seconds. This is convenient if you have to distinguish a machine among many machines on the rack.

RESETTING THE SERVER

If the server halts before starting the OS, press and hold **Ctrl** and **Alt** and press **Delete**. This restarts the server.

> **IMPORTANT:** Resetting the server clears the DIMM memory and the data in process. To reset the server when it is not frozen, make sure that no processing is in progress.

FORCED SHUTDOWN

Use this function when an OS command does not shut down the server, the POWER switch does not turn off the server, or resetting does not work.

Press and hold the POWER switch on the server for at least four seconds. The power is forcibly turned off. To turn on the power back again, wait approximately 10 seconds after turning off the power (forced shutdown).
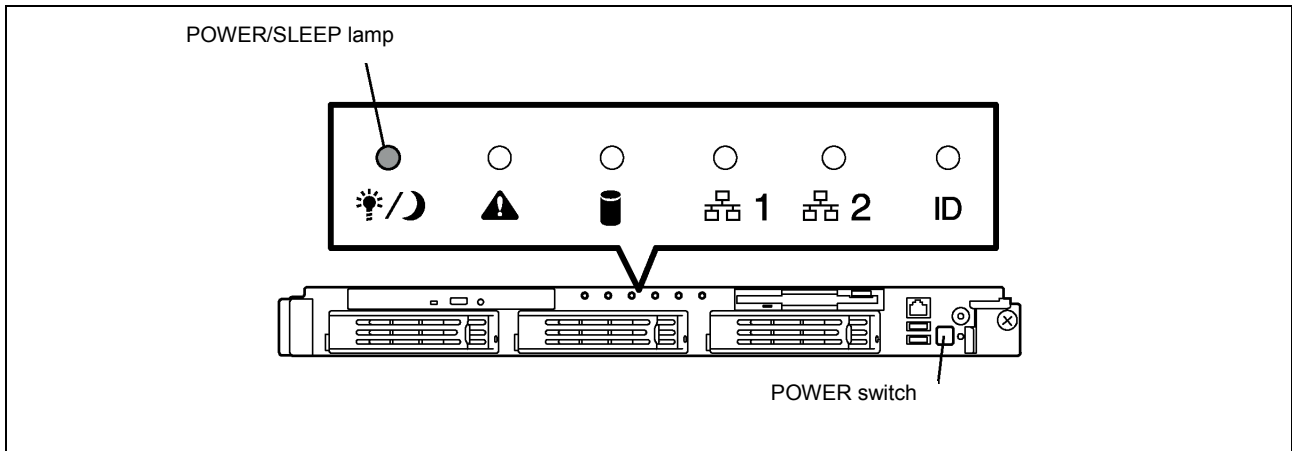
> **IMPORTANT:** If the remote power-on function is used, cycle the power once to load the OS, and turn off the power again in the normal way.

Chapter 7

Upgrading Your Server

This chapter describes the internal optional devices available for your server, procedures for install or removing such optional devices, and notes on using them.

IMPORTANT:

- Optional devices described in this chapter may be installed or removed by any user. However, NEC does not assume any liability for damage to optional devices or the server or malfunctions of the server resulted from installation by the user. NEC recommends you ask your sales agent for install or removing any optional devices.

- Make sure to use only optional devices and cables authorized by NEC. Repair of the server due to malfunctions, failures, or damage resulted from installing such devices or cables will be charged.

- When you made any change to the hardware configuration, make sure to update the system (see Chapter 4 for details.).

SAFETY NOTES

Observe the following notes to install or remove optional devices safely and properly.

⚠ WARNING
Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. ■ Do not disassemble, repair, or alter the server. ■ Do not look into the CD-ROM drive. ■ Do not remove the lithium battery. ■ Disconnect the power plug before working with the server.

⚠ CAUTION
Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. ■ High temperature ■ Make sure to complete board installation. ■ Do not lift the server only by a single person. ■ Do not install the server on the rack leaving the cover removed. ■ Do not install the server on the rack halfway.

ANTI-STATIC MEASURES

The server contains electronic components sensitive to static electricity. Avoid failures caused by static electricity when installing or removing any optional devices.

- Wear a wrist strap (an arm belt or anti-static glove).

    Wear a wrist strap on your wrist. If no wrist strap is available, touch an unpainted metal part of the cabinet before touching a component to discharge static electricity from your body.

    Touch a metal part regularly when working with components to discharge static electricity.

- Select a suitable work space.

    – Work with the server on the anti-static or concrete floor.

    – When you work with the server on a carpet where static electricity is likely to be generated, make sure take anti-static measures beforehand.

- Use a work table.

    Place the server on an anti-static mat to work with it.

- Cloth

    – Do not wear a wool or synthetic cloth to work with the server.

    – Wear anti-static shoes to work with the server.

    – Take off any jewels (a ring, bracelet, or wrist watch) before working with the server.

- Handling of components

    – Keep any component in an anti-static bag until you actually install it to the server.

    – Hold an component by its edge to avoid touching any terminals or parts.

    – To store or carry any component, place it in an anti-static bag.

PREPARING YOUR SYSTEM FOR UPGRADE

Follow the procedure below to prepare for installing or removing components.

1. Shut down the OS.

2. Unlock the front bezel.
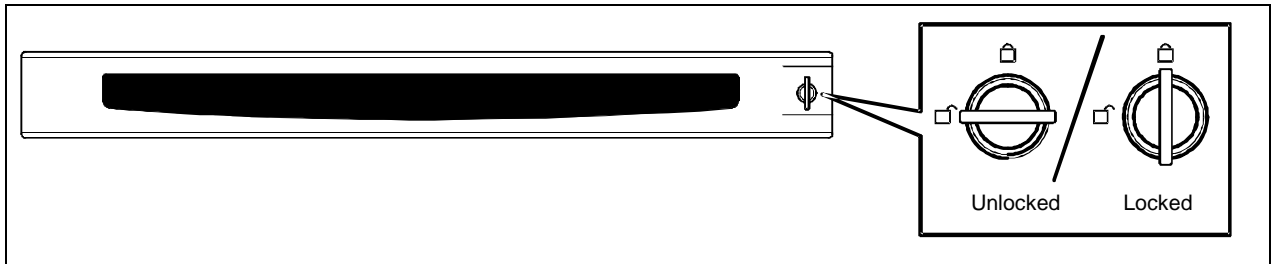
3. Remove the front bezel.

4. Press the POWER switch to power off the server (the POWER/SLEEP lamp goes off).

5. Remove all cables and power cords from the server.
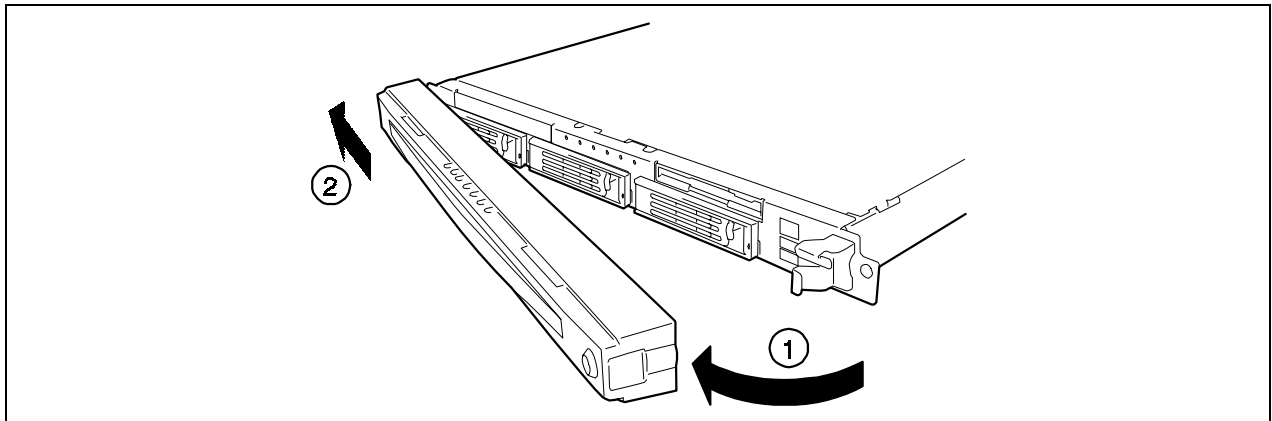
DEVICE INSTALLATION OR REMOVAL PROCEDURE

Install or remove a component from the server using the following procedures.

Hard Disk Drive

The server has three device bay slots available to install hard disks with the SCA2 interface (Ultra 160 SCSI) in the disk bay of the front of the server.

IMPORTANT:

- For disk array configuration, specify RAID0, RAID1, RAID5 or RAID0+1 as the RAID level.

All three slots may contain a hard disk approximately 25.4 mm (1 inch) high. The SCSI IDs (ID0 through ID2) are always assigned to hard disks as shown below.
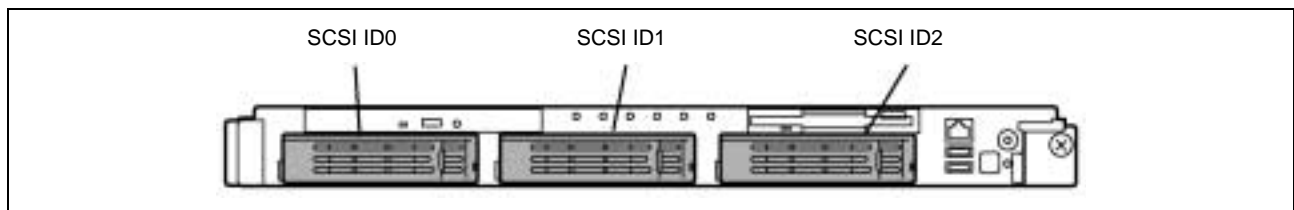
The hard disk drive bays are connected to the SCSI connector on the system board when the server is shipped. To use the hard disk drives in a disk array configuration, reconnect the cable from the connector on the system board to which the SCSI controller is connected to the disk array controller connector. For the cable reconnection, see "Disk Array Controller".

A dummy tray is installed in hard disk drive bays defined as SCSI ID1 and SCSI ID2. The purpose of a dummy tray is to increase the cooling effect in the server. Install a dummy tray in slots not containing a hard disk drive.

Installation

Perform the following steps to install a hard disk drive.

> **NOTE:** Any hard disk can be installed or removed from the server by only removing the front bezel of the server

> **IMPORTANT:** In the disk array configuration, use the hard disks having the same specification including the capacity.

1. Prepare your system for upgrade. See "Preparing for Installation and Removal" described earlier in this chapter.

2. Unlock the front bezel with the security key and remove the front bezel.
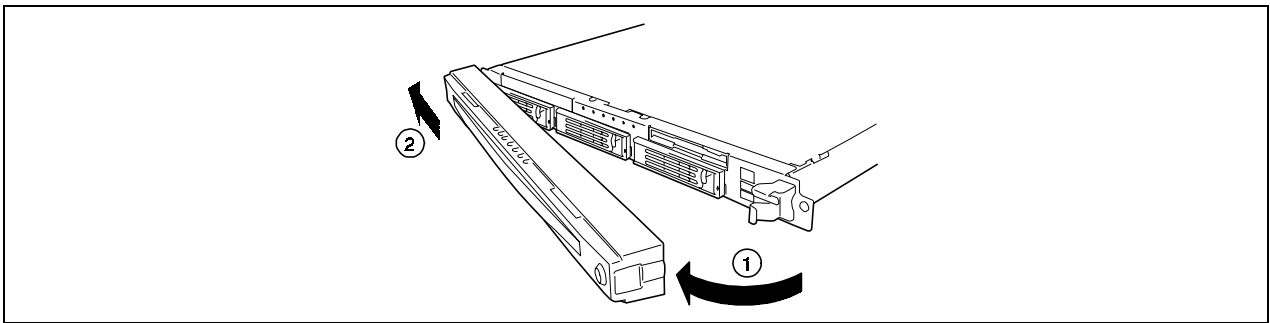
3. Locate the slot in which you are going to install a hard disk drive.

   The server has three slots. Install hard disk drives in ascending order of the SCSI ID numbers starting from the leftmost slot (SCSI ID0).

4. Remove the dummy tray. The dummy tray is released by pressing down on the lock button inside the top of the tray handle, pulling the tray handle towards you, and pulling the tray out of the bay.

   > **IMPORTANT:** The dummy tray is provided to maintain the proper cooling effect. Always leave the dummy tray in unused bays so that the server can operate efficiently. Save the dummy tray for future use.
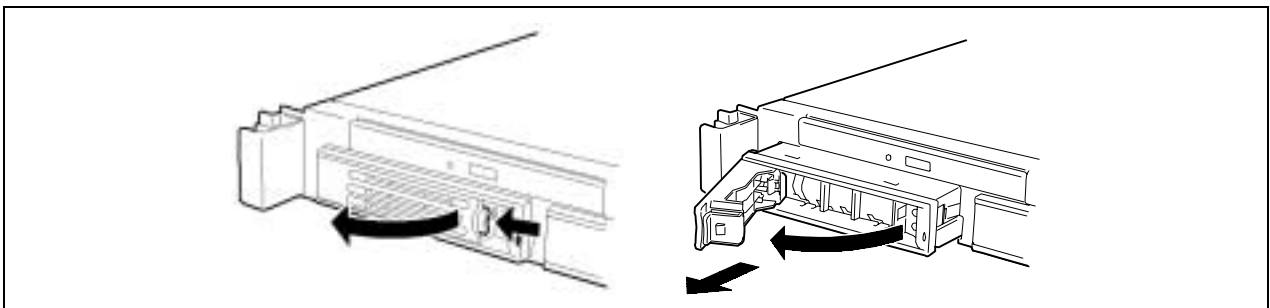
5. Remove the four screws that hold the air baffle to the tray and remove the air baffle. Save the air baffle for future use.
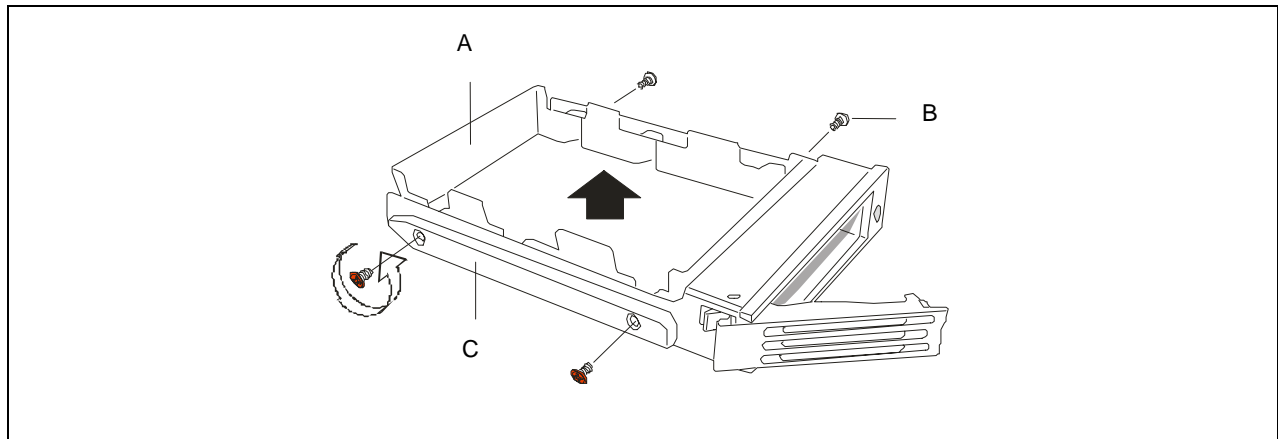
A	Air baffle
B	Screws (4)
C	Drive carrier

6. Remove the hard disk drive from its protective wrapper and place it on an antistatic surface. Record the drive model and serial number in the equipment log.

7. Set any drive jumpers or switches before you install the drive. See the documentation that comes with the device for jumper or switch information.

8. Place the drive into the drive tray removed in steps 3 and 4 above. Orient the drive so that its component side is down and its data connector is facing the rear of the tray. The connector should be flush with the rear of the tray.

> **NOTE:** If the drive comes with drive rails, do not use them. Remove any rails already attached.

9. Using the four screws removed earlier, attach the tray to the drive.
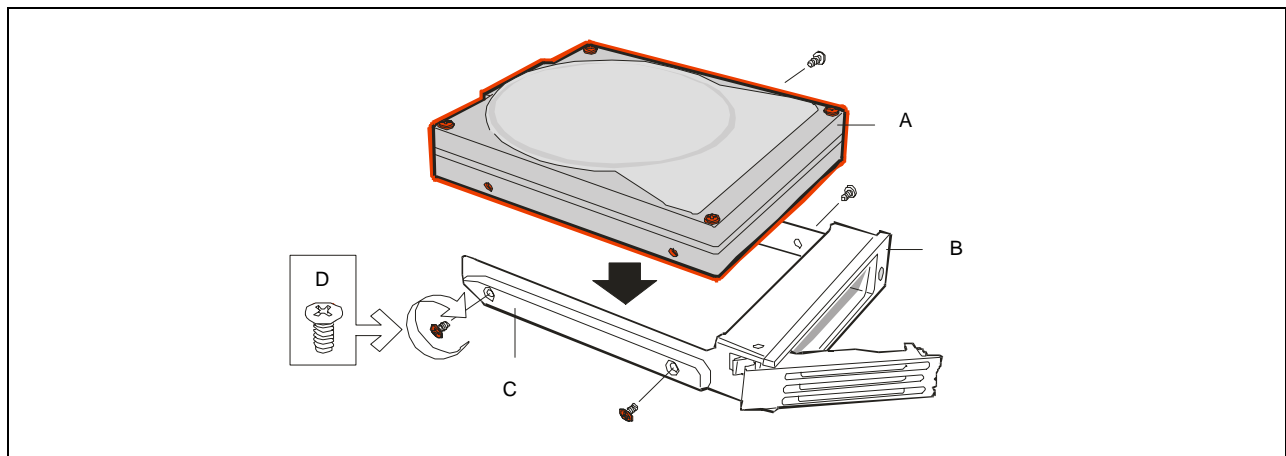
A	Hard disk drive
B	Drive carrier
C	Positioning rail
D	Screws (4)

10. Firmly hold the additional hard disk drive (with the tray provided) and handle, and align it so that it engages the guide rails in the drive bay.

    IMPORTANT:

    ■ Push the hard disk drive until the handle hook butts to the frame.

    ■ Carefully hold the hard disk drive with both hands.
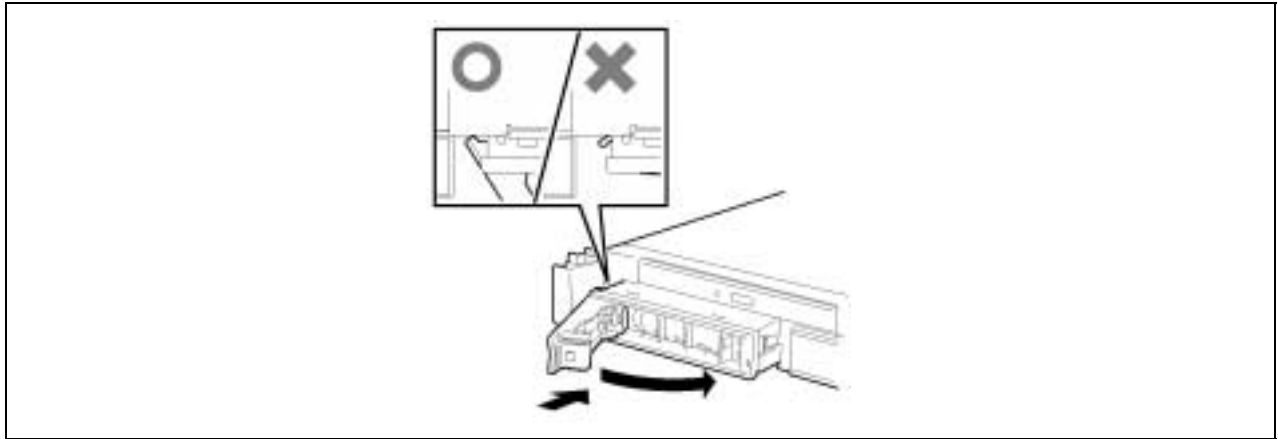
11. Slowly lift the handle.

    The handle is locked when a "click" is heard.

    IMPORTANT: Be careful not to get your finger caught between the handle and tray.

    NOTE: Confirm that the handle is hooked to the frame when having inserted the hard disk drive.

12. Power on the server, start the SETUP utility, select [Boot] → [Hard Disk], and set the boot priority in the submenu.

    This operation is necessary because installing an additional hard disk drive clears the current setting of the boot priority.

    IMPORTANT:

    ■ To add a hard disk during operation of the Global Array Manager (GAM), click the Scan Device key after about 90 seconds have passed from the installation of the hard disk. If you click the Scan Device key after executing the Expand Array, the added disk appears correctly.

    ■ If a hard disk is added to the server operating in RAID1 by using the expand array feature, the RAID is automatically changed to RAID0+1. (However, it is not possible to set RAID0+1 directly by using a specific utility.)

13. Install the front bezel you removed in step 2.

There are tabs on the left side of the front bezel. Engage the tabs with the server frame, install the front bezel, and lock it with the security key.

Removal

Take the following steps to remove a hard disk drive:

> **NOTE:** If removing a failing hard disk drive, confirm the slot in which the DISK lamp of the hard disk drive is amber before starting the removal.

DISK lamp
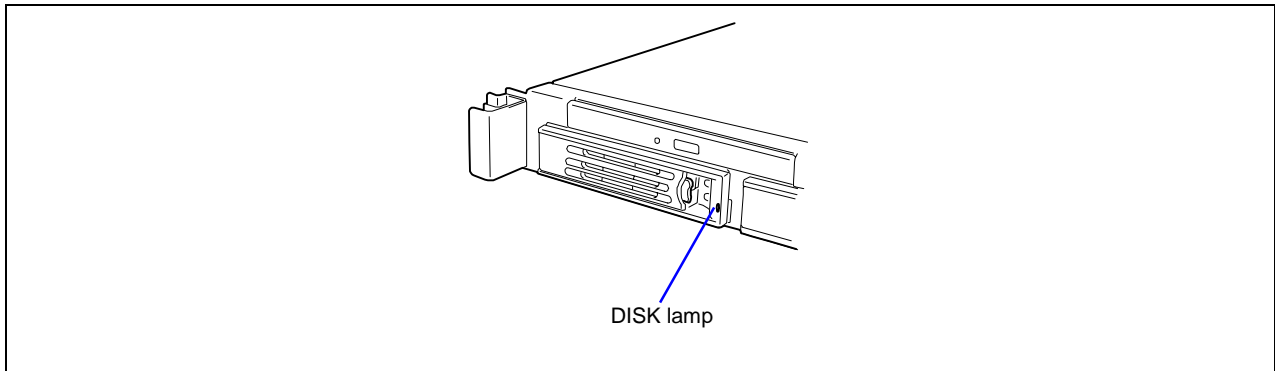
1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Unlock the front bezel with the security key, and remove the front bezel.

3. Push the lever to unlock, and put the handle down.
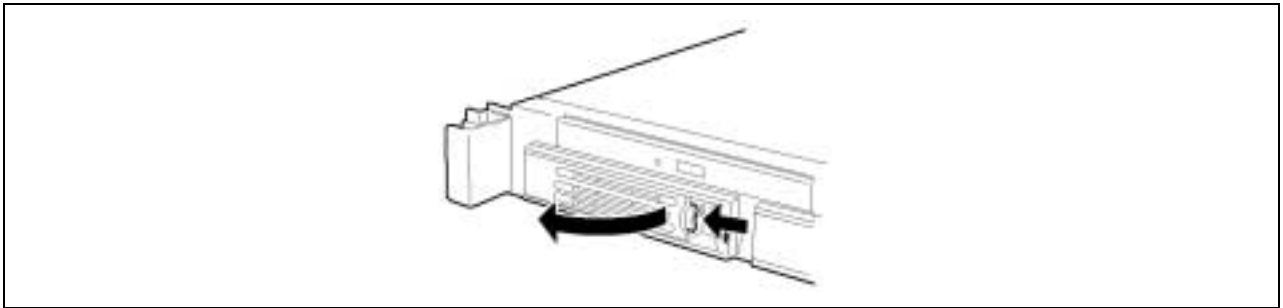
4. Firmly hold the handle and hard disk drive, and pull out the hard disk drive.

5. If using the server with the hard disk drive removed, install the dummy tray in the empty slot.
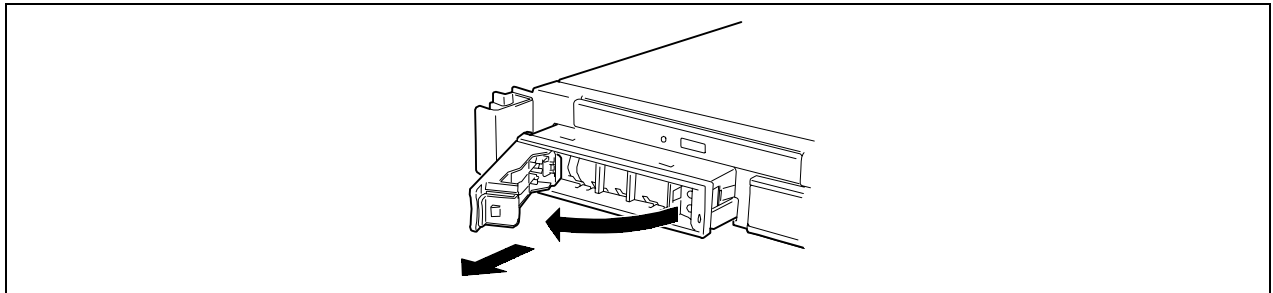
6. Power on the server, start the SETUP utility, select [Boot] → [Hard Disk], and set the boot priority in the submenu.

This operation is necessary because installing an additional hard disk drive clears the current setting of the boot priority.

7. Install the front bezel you removed in step 2.

When the hard disks are in the disk array configuration, you can restore the state before an error using the auto-rebuild feature that stores the data in the old hard disk into a new one.

The auto-rebuild feature is available for the RAID1, RAID5, or RAID0+1 disk array configuration.

Auto-rebuild is carried out when you hot-swap a failed hard disk with a new one (replace the disk while the server is powered). While auto-rebuild is in progress, the DISK lamp flashes green and amber alternatively to indicate it.

IMPORTANT:

- When auto-rebuild fails, the DISK lamp lights in amber. Remove and install the hard disk again to restart auto-rebuild.

- If the disk array monitoring utility is installed, it may display or act as follows. If the DISK lamp does not light in amber after auto-rebuild, however, auto-rebuild has completed successfully.

  - Displays "Rebuild was cancelled" on the screen while auto-rebuild is in progress.

  - Appears to stop and restart auto-rebuild.

Observe the following notes for auto-rebuild.

- Do not power off the server in the period between a hard disk error and completion of auto-rebuild.

- When you removed a hard disk, wait at least 90 seconds before installing the hard disk back again.

- Do not replace another hard disk while rebuilding is in progress. (The DISK lamp flashes in green and amber alternatively while rebuilding the hard disk.)

Server ~ Pull-out from the Rack ~

The server needs to be pulled out from the rack for installing/removing any components other than the hard disk drives and power supply units.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury.

- Do not install the server on a rack with leaving covers removed.
- Do not pinch your finger with mechanical components.
- Note high temperature.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.

---

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

    > **NOTE:** To confirm the device you are going to maintain, use the UID switch and the UID lamp that goes on when the switch is pressed.

2. Loosen the set screws at the right and left of the front panel, hold the handles, and slowly pull out the server from the rack.

    The server is locked while you are pulling it. Stop pulling when it is locked.

Set screw   Set screw
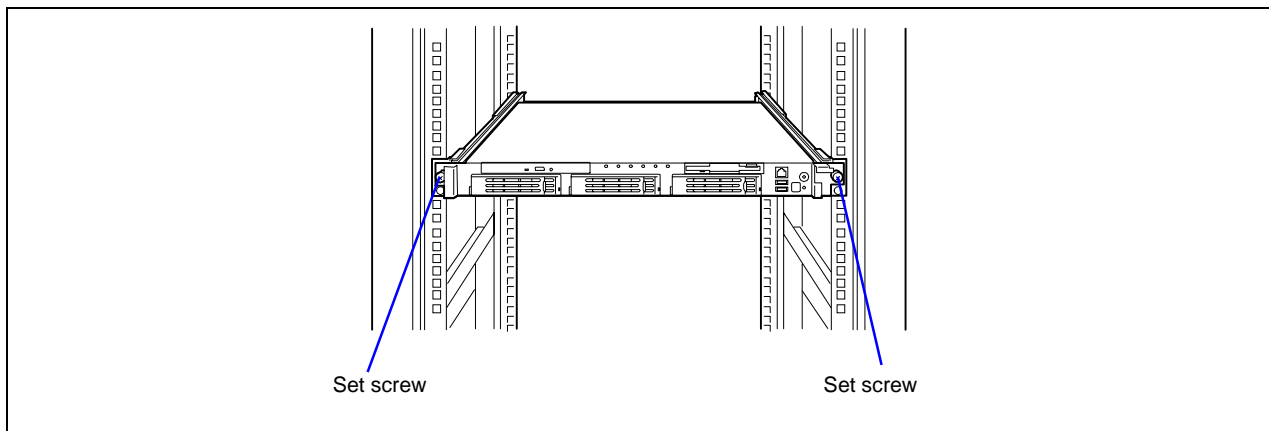
To place the server in the rack, push it back into the rack while pressing the right and left lock arms.

IMPORTANT: Be very careful not to get your finger caught in the arms or rails.
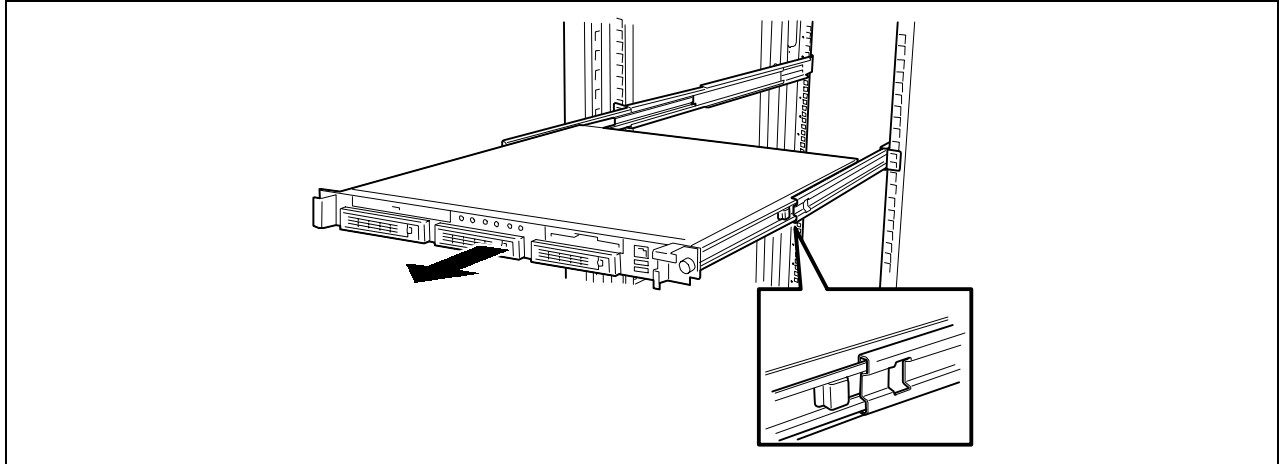
Top Cover

Open the top cover when installing/removing an internal device or reconnecting an internal cable.

Removal

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Pull out the server from the rack.

3. Loosen the set screw on the rear, and remove the top cover.
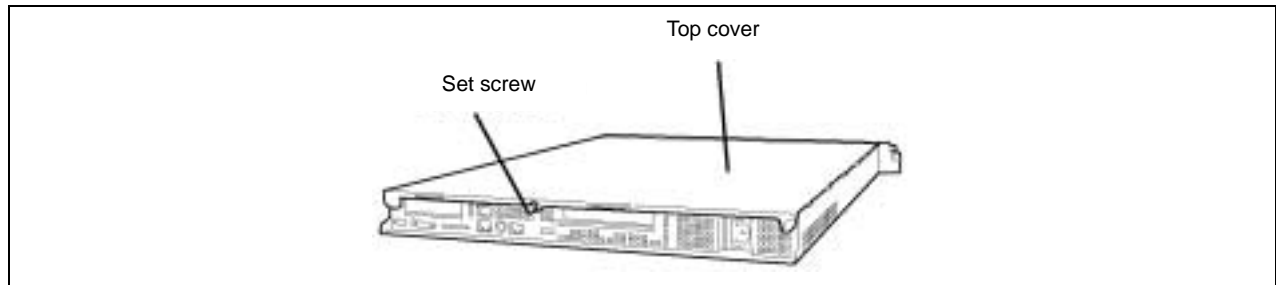
IMPORTANT: Firmly hold the whole top cover, and lift it up straight. Lifting up the rear of the cover may cause the cover frame of the front to damage cables in the server.
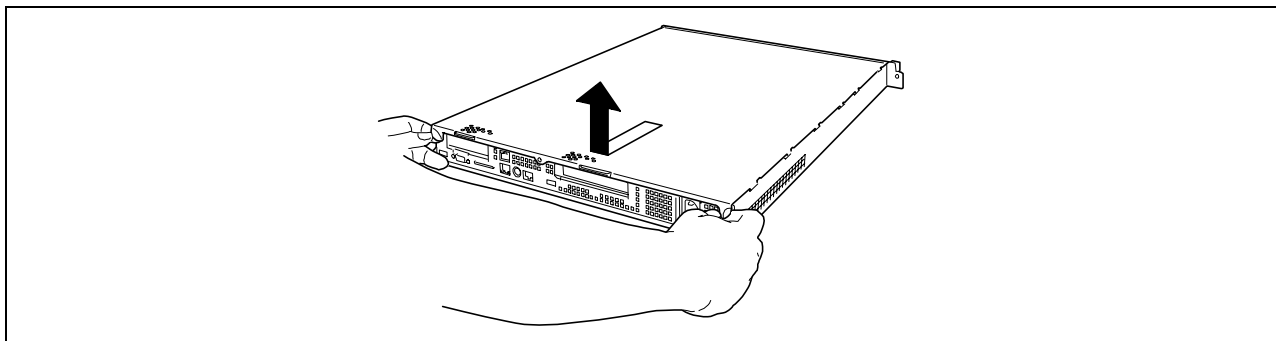
Installation

When installing the top cover, hold the top cover parallel to the server, and place it on the server. Confirm that all the tabs of the top cover are securely inserted into the slots in the server frame, and then secure the cover with the set screws.

> **IMPORTANT:** Be very careful not to damage the internal flat cable (connected to the LED board on the front panel) by the tab on the server front side.

Do not damage the cable by the tab.
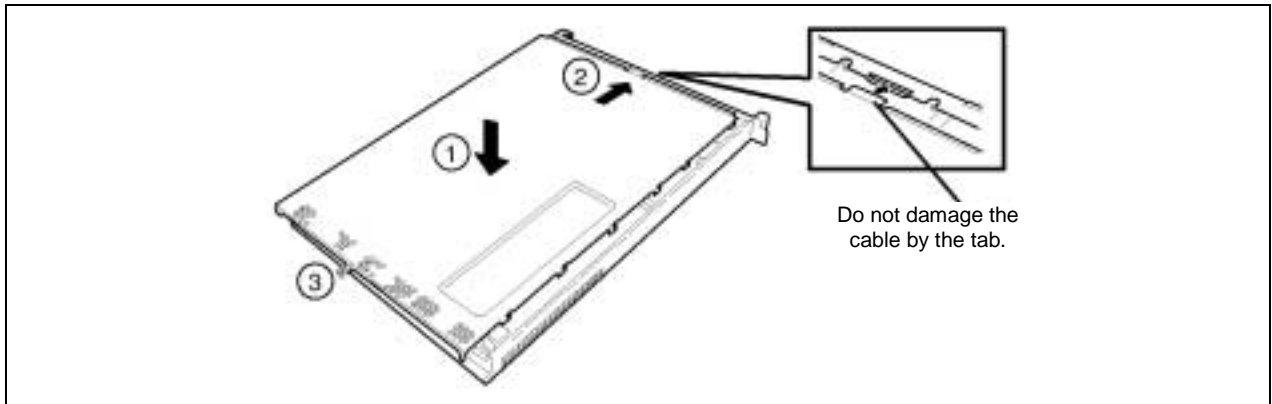
DIMM

Install the additional DIMM (Dual Inline Memory Module) to the DIMM socket on the system board in the server. The system board is provided with six DIMM board slots.

> **NOTE:** Up to 6GB of memory (1GB DIMM x 6) can be installed. (The DIMMs installed as standard need to be replaced in this case.) A DIMM of 128MB is installed in DIMM slots #1A and #1B at shipment.

> **IMPORTANT:**
>
> - The DIMM is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the DIMM. Do not touch the DIMM terminals or on-board parts by a bare hand or place the DIMM directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
>
> - Make sure to use the DIMM authorized by NEC. Installing a third-party DIMM may cause a failure of the DIMM as well as the server. Repair of the server due to failures or damage resulted from installing such a board will be charged.

Installation Order

Install two DIMMs in ascending order of paired-slot numbers.

DIMM 3B
DIMM 2B
DIMM 1B
DIMM 3A
DIMM 2A
DIMM 1A

REAR   FRONT

System board
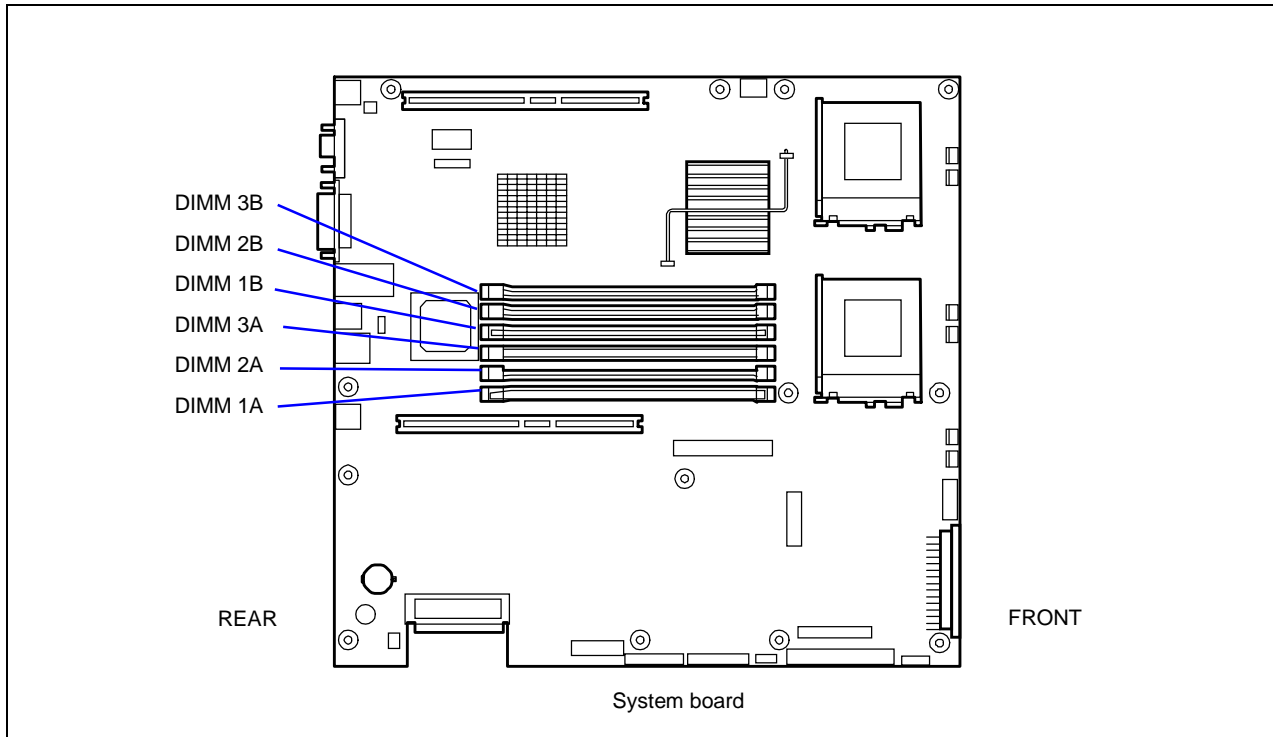
IMPORTANT: Install two additional DIMMs for each BANK (*1) because the server uses interleaved memory. If DIMMs of different specifications (*2) are installed in a BANK, the server does not operate normally.

*1 A BANK is a unit of two DIMM slots. Each pair of DIMM slots #1A and 1#B (DIMM group #1), #2A and #2B (DIMM group #2), and #3A and #3B (DIMM group #3) in the figure is a BANK. (The symbols are also printed on the system board.)

*2 DIMM specification is shown on the label attached to the DIMM as follows:

Example: Frequency of 133 MHz, buffered, capacity of 128 MB,
            raw address of 12 bits, column address of 10 bits, and
            single side

133 / B / 128 / R12   C10   S

Single side
Column address
Raw address
Capacity
Buffered
Frequency

Installation

Install a DIMM in the following procedure.

> **IMPORTANT:** The server supports DIMMs of only the low-profile type (30 mm (1.2 inches) in height). It does not support DIMMs exceeding the specified height.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Open the top cover.
4. Remove the DIMM cover from the socket into which you are going to install a DIMM.

    Open the levers at both ends of the socket. The cover is released from the socket.

    > **IMPORTANT:** Keep the removed DIMM cover for future use.
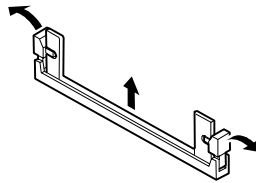
5. Push the DIMM straight into the socket.

    > **NOTE:** Make sure of the orientation of the DIMM.
    > Each DIMM has a slit on the terminal side for preventing wrong insertion.

    The levers automatically close when the DIMM is inserted into the socket.
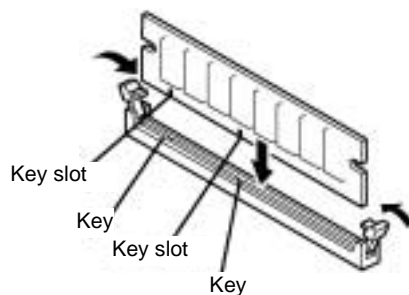
6. Install the components you removed in steps 1 to 3.

7. Power on the server and verify that POST displays no error messages.

   If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 6.

8. Start the SETUP and select [Advanced] → [Memory Configuration] to verify that the installed DIMM shows the status "Installed". (See Chapter 3 or details.)

9. Select "Yes" for [Reset Config Data] on the [Advanced] menu.

   This setting is required to change the hardware configuration data. See Chapter 3 for details.

10. If Windows 2000 or Windows NT 4.0 is in use, set the paging file size to the recommended value or a greater value as shown below.

   – For Windows 2000:   Total memory size × 1.5

   – For Windows NT 4.0: Total memory size + 12MB

   If NetWare is in use, reserve the disk space in the MS-DOS partition for a memory dump.

Removal

Remove the DIMM depending on the following procedure.

> **NOTES:**
>
> - To remove the failed DIMM, check the error message appearing in POST or ESMPRO to identify the DIMM socket (group) in which the failed DIMM is installed.
>
> - The server operates only when at least two DIMMs are installed.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Pull out the server from the rack.

3. Open the top cover.

4. Open the levers at both sides of the socket from which you remove the DIMM.

   The DIMM is unlock and ready for removal.
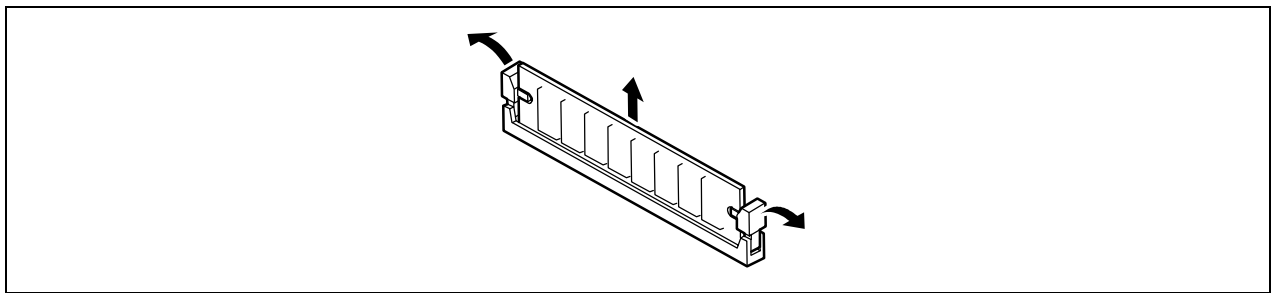
5. Reinstall all parts removed in Step 2.

   Power on the server and verify that POST displays no error messages.

   If POST displays an error message, take a note on the message and see the POST error messages listed in6.

6. Start the SETUP and select [Advanced] → [Memory Configuration] → [Memory Retest] → [Enabled] to clear the error information of the removed DIMM. (See Chapter 3 for details.)

7. Select "Yes" for [Reset Config Data] on the Advanced menu.

   This setting is required to change the hardware configuration data. See Chapter 3 for details.

Processor (CPU)

The server may have another CPU installed in addition to the standard CPU (Intel Pentium III Processor).

IMPORTANT:

- The CPU is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the CPU. Do not touch the CPU pins by a bare hand or place the CPU directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.

- Do not operate the system until confirming that the additionally installed CPU is in normal state.

- Make sure to use the CPU authorized by NEC. Installing a third-party CPU may cause a failure of the CPU as well as the server. Repair of the server due to failures or damage resulted from installing such a board will be charged.

Processor 2

Processor 1

REAR

FRONT

System board
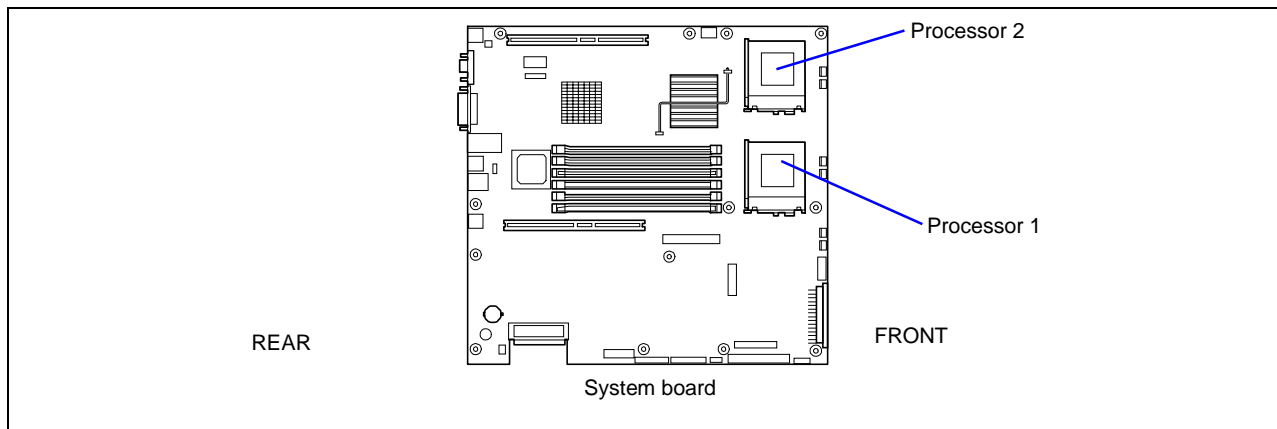
NOTE: If the different revision of the processor is installed in the
multiprocessor system, Windows 2000 logs the following information
every startup. If this message is logged, it is no problem for operation.
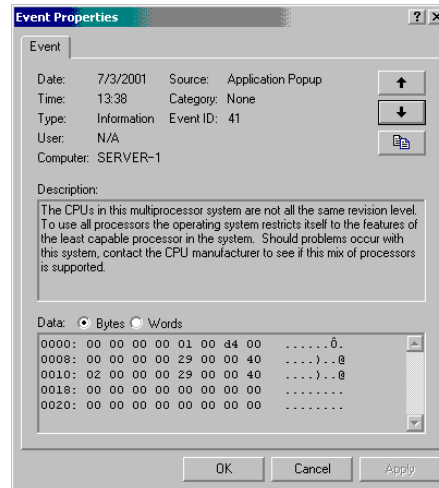
Installation

Take the following steps to install the CPU. The EXPRESSBUILDER CD-ROM provided with the server is necessary for confirming that the additionally installed CPU is in normal state. Provide the CD-ROM beforehand.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Pull out the server from the rack.

3. Open the top cover.

4. Remove the terminator by lifting the lever on the socket.

> **IMPORTANT:** Save the removed terminator for future use.
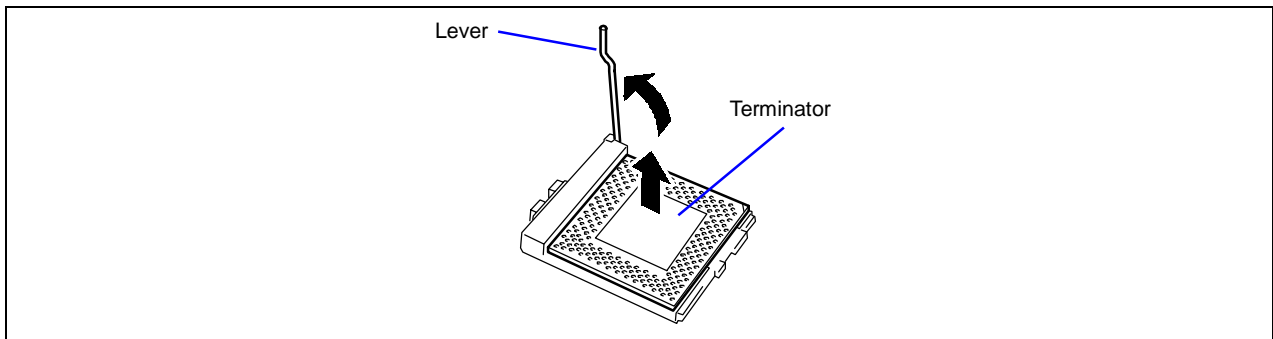
5. Put the CPU slowly and gently on the socket.

> **IMPORTANT:** Be aware of CPU direction. Pin layouts on two corners among four differ from others to prevent an incorrect insertion. Confirm the pin mark and pin layout on the socket, and insert the CPU correctly.
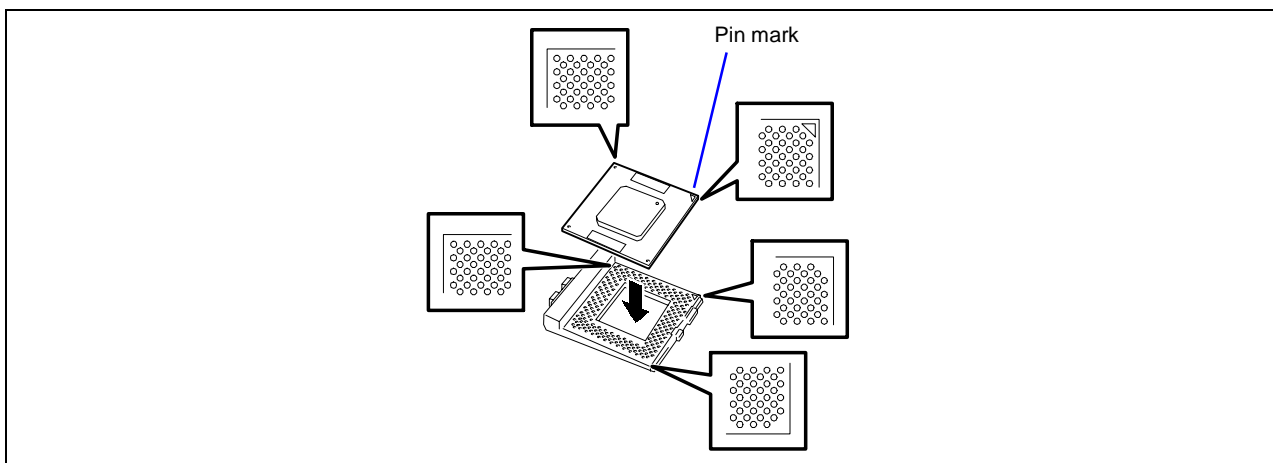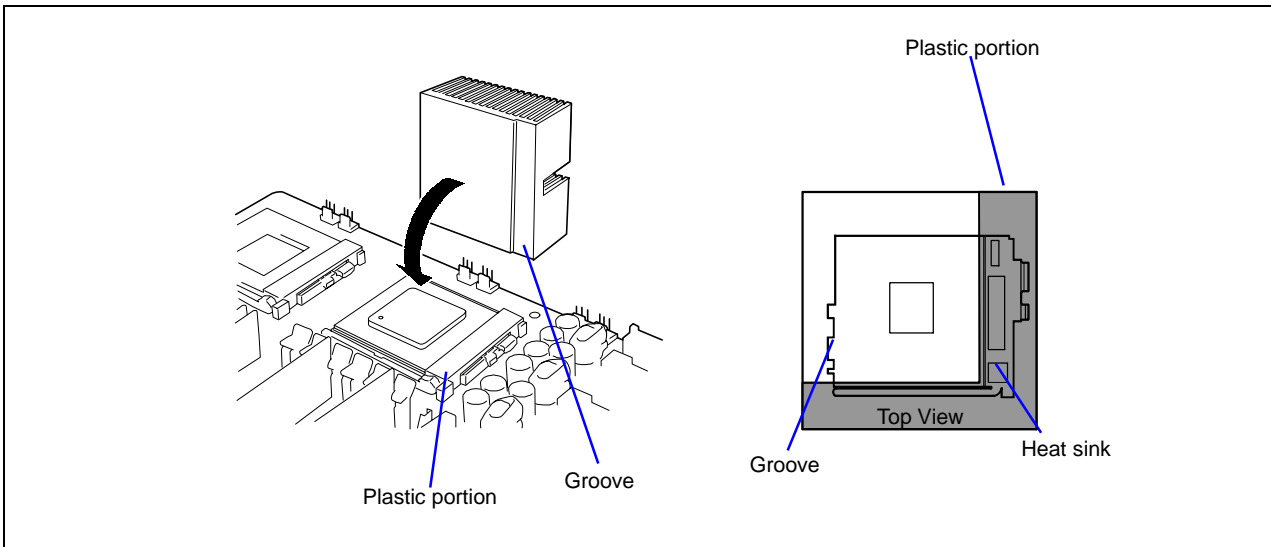
**6.** Push the CPU lightly to the socket, and push down the lever to secure the CPU.
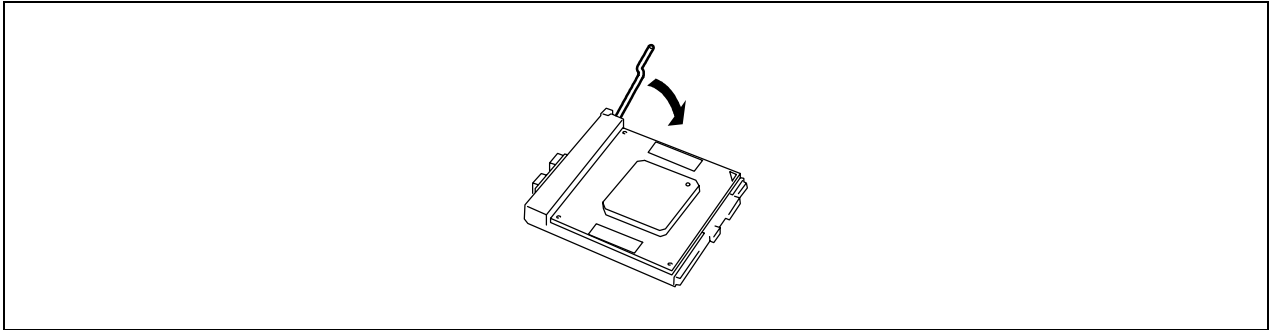

7. Put the heat sink on CPU.

> **NOTE:** Be aware of direction of heat sink. The bottom of the heat sink has L-shaped groove. Put the heat sink so that the groove fit the lever and plastic part of the socket.

The wire clip is already installed on the heat sink at purchase. If it comes off, install it according to the figure below.
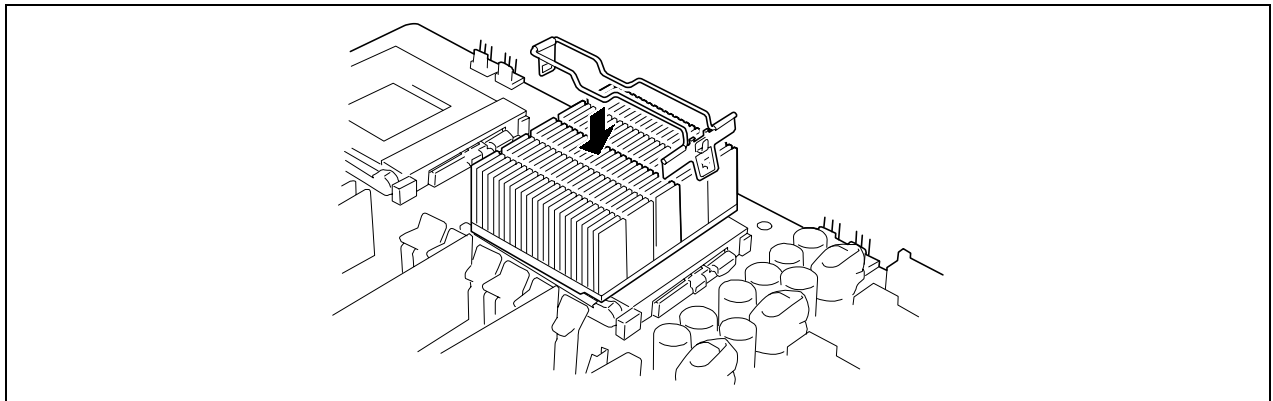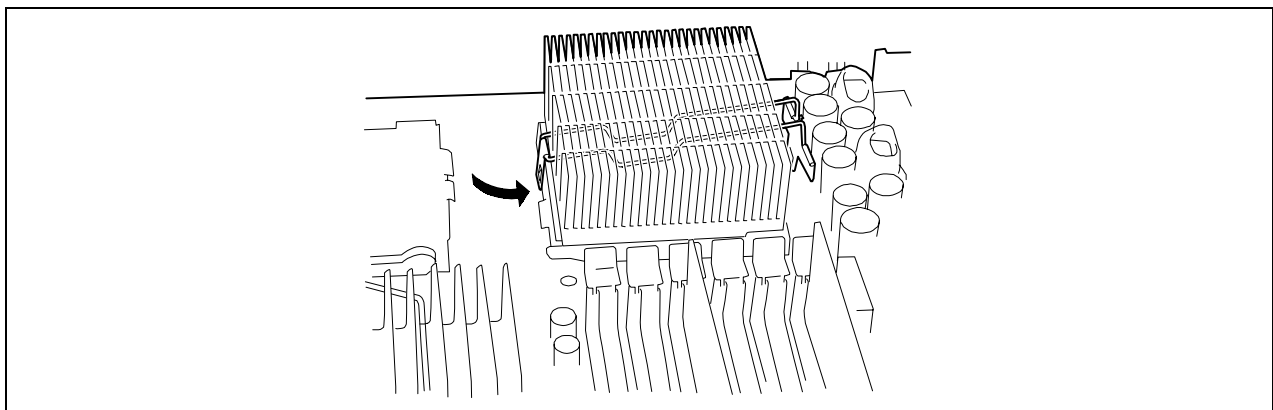

> **NOTE:** Ensure that the wire clip Make sure of the orientation of the wire clip.

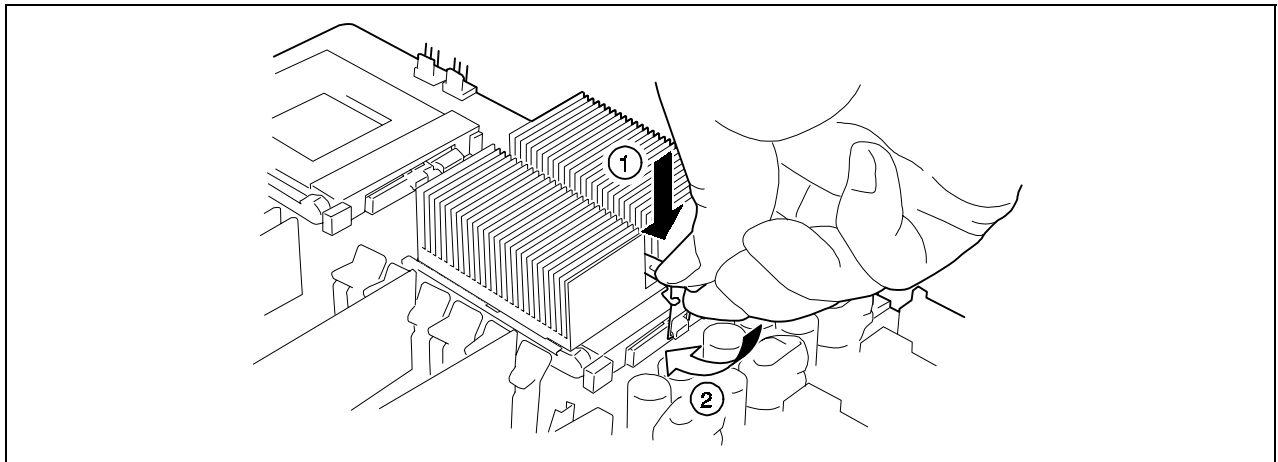Bracket attached to the wire clip

Groove in the heat sink
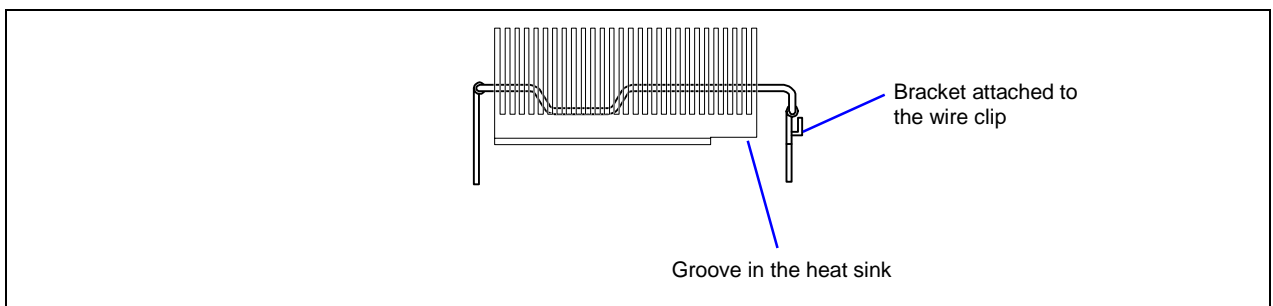
8. Engage the wire clip with the socket.

The bracket-attached side must be engaged with the rear of the socket.

9. Insert a standard screwdriver into the bracket of the wire clip, and engage the wire clip with the socket.

10. Make sure that the heat sink is level.

> **NOTES:**
>
> ■ If the heat sink is not level, remove it, and then install it again. The following probably causes the heat sink not to be level:
>
>   – The heat sink is not positioned correctly.
>
>   – The wire clip is not engaged correctly.
>
> ■ Do not move the secured heat sink.

11. Install the components you removed previously.

12. Power on the server, start the SETUP utility, and select [Main] → [Processor Settings] → [Processor Retest] → [Enabled].

13. Insert the EXPRESSBUILDER CD-ROM into the CD-ROM drive, and start the system through EXPRESSBUILDER.

    For details, see Chapter 6.

14. Diagnose the system.

    For details, see EXPRESSBUILDER User's Guide on the EXPRESSBUILDER CD.

15. Verify the temperature indication (Crnt column) displayed on the diagnostic window.

If the indication is either of the following, it is assumed that the heat sink is incorrectly attached. If no abnormality is shown in temperature indication, you can resume the diagnostics. After the diagnostics is complete, power off the server.

– Processor 2 Temp is higher than Ambient Temp by 30°C or more

– Processor 2 Temp is higher than CPU1 Temp by 10°C or more

If the indication is either of the above, repeat steps 7 and subsequent steps.

16. Verify that POST displays no error messages.

If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 6.

17. Select [Main] → [Processor Settings] → [Processor Retest] → [Enabled].

This setting is required to change the hardware configuration data. See Chapter 3 for details.

18. To add one or more CPUs to the server in 1-CPU configuration to operate the server with more than one CPU, do the procedure below:

For Windows 2000, change the driver of [Computer] in the device manager to [ACPI multi-processor PC] and then update the system.

For Windows NT 4.0, update the system.

For NetWare, update the modules required referring to the manual of NetWare.

Removal

Take the following steps to remove the CPU. The EXPRESSBUILDER CD-ROM provided with the server is necessary for confirming that the additionally installed CPU is in normal state. Provide the CD-ROM beforehand.

> **IMPORTANT:**
>
> - Do not remove any CPU unless it is failed.
> - Install a terminator on any slot in which a CPU is not installed.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Pull out the server from the rack.

3. Open the top cover.

4. Remove the heat sink.
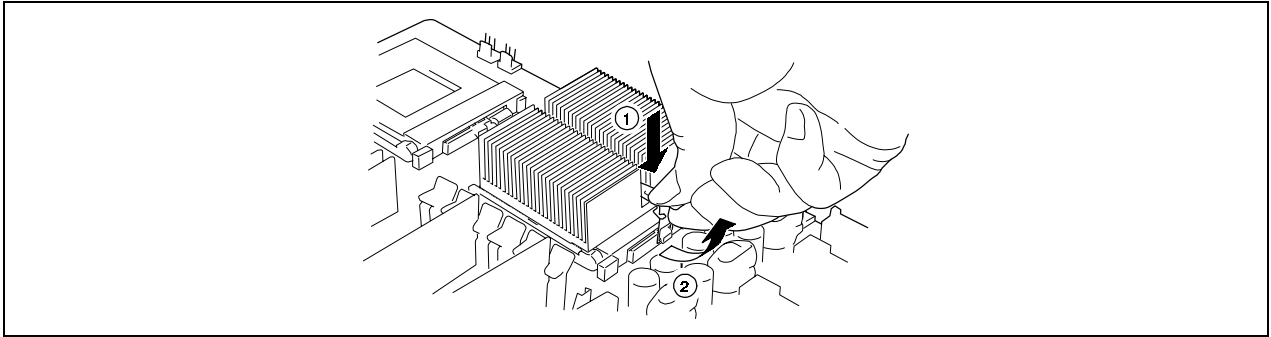
5. Lift the CPU socket lever to the up position (see figure below).
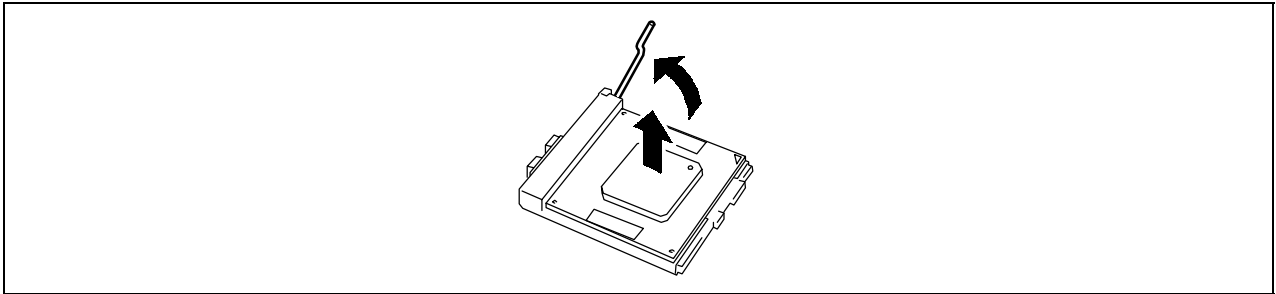
6. When you replace the CPU, install the CPU according to the steps in Installation Procedure.

   When you remove the CPU and do not replace with new one, install a CPU in CPU slot #1, and attach a terminator to CPU slot #2.

7. Reinstall all parts removed.

8. Power on the server and start SETUP to select menus [Main] → [Processor Settings] → [Processor Retest] → [Enabled] (see Chapter 3).

9. Execute the system diagnostic program and verify its result as described in installation procedure.

10. Verify that POST displays no error messages.

    If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 6.

11. Start SETUP and select [Main] → [Processor Settings] → [Processor Retest] → [Enabled] to clear error information of removed CPU (see Chapter 3).

    When you replaced a CPU, select [Main] → [Processor Setting] to verify that the ID and L2Cache of the additional CPU are defined normally (see Chapter 3).

12. Select "Yes" for [Main] → [Processor Settings] → [Processor Retest].

    This setting is required to change the hardware configuration data. See Chapter 3 for details.
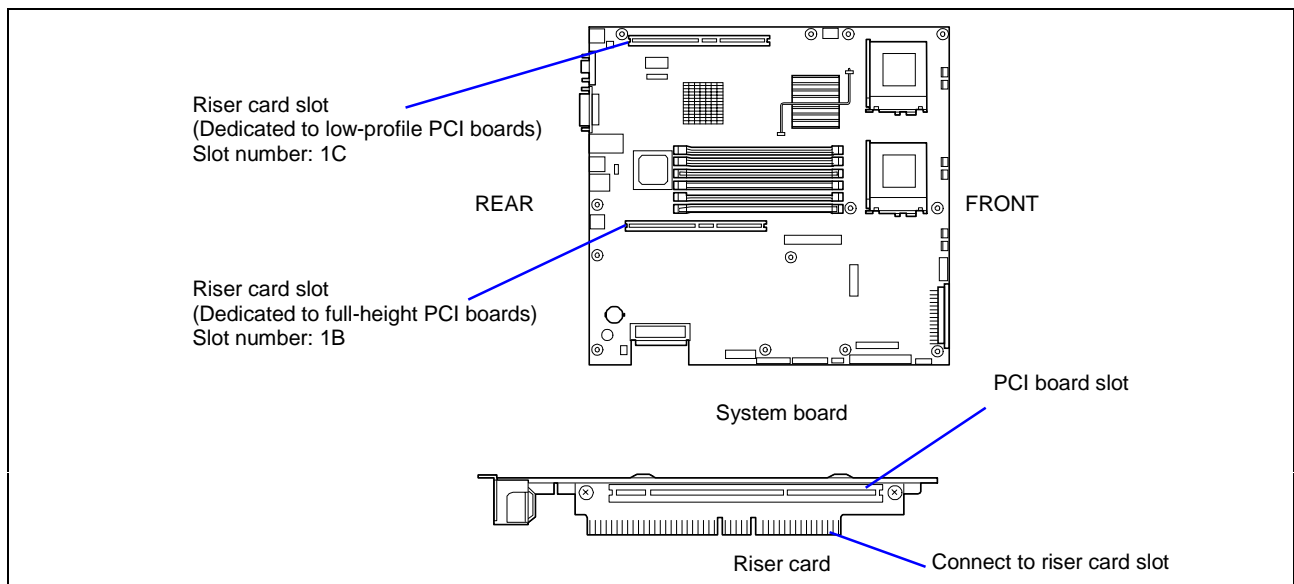
PCI Board

The server has two "riser cards" on the system board that allow installation of PCI boards. Three PCI boards can be installed on each riser card. (Up to six PCI boards can be installed in total.)

Insert PCI boards for network extension and file device function extension into PCI board slots in each riser card.

IMPORTANT:

- The PCI board is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the PCI board. Do not touch the PCI board terminals or on-board parts by a bare hand or place the PCI board directly on the desk. For static notes, see the section "Anti-static Measures".

- Some restrictions are imposed on the combination of PCI boards that can be installed in the server. Contact your sales agent for details.

- A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.

NOTE: Some PCI boards use an on-board expanded ROM. See the manual provided with the PCI board to determine whether expanded ROM needs to be loaded. Use the BIOS setup utility "SETUP" for the setting. For details, see Chapter 3.

Notes

Observe the following notes on installing/removing a PCI board:

- Do not touch the terminals of the riser cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.

- A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.

- If the internal hard disk drives are used in a disk array configuration by installing the N8103-53F disk array controller, the access lamp that indicates the status of access to the internal hard disk drive does not function.

- PCI slot number "1C" is assigned to the riser card for low-profile PCI boards, and "1B" is assigned to the riser card for full-height PCI boards.

- Set "Disabled" for the optional ROM of a LAN device not to be booted by using the BIOS setup utility.

- If an additional LAN device is installed, it is hard to push the catch of the connector with your finger that is connected to the LAN port. Disconnect the connector pushing the catch with a standard screwdriver. At this time, be very careful for the screwdriver not to damage the LAN port or other ports.

- If a bootable PCI board (e.g., a disk array controller, SCSI controller, or LAN card) is additionally installed, the boot priority is changed to the default. After the additional installation, start the BIOS setup utility, select [Boot] → [Boot Device Priority], and set the new boot priority.

Installation

Take the following steps to install a PCI board on the riser card:

> **IMPORTANT:** The full-height riser card is equipped with an "insulator (black)" to protect PCI boards. Do not remove the insulator, and handle it carefully. The insulator is not shown in the figures in this manual for simplifying the illustrations.

> **NOTES:**
>
> - Each riser card supports low-profile or full-height PCI boards. Before installing a PCI board, confirm that the type of the PCI board.
>
> - When installing a PCI board, confirm that the card connector matches the connector of the riser card.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Pull out the server from the rack.

3. Remove the top cover.

4. Lift straight up and remove the riser card from the server.
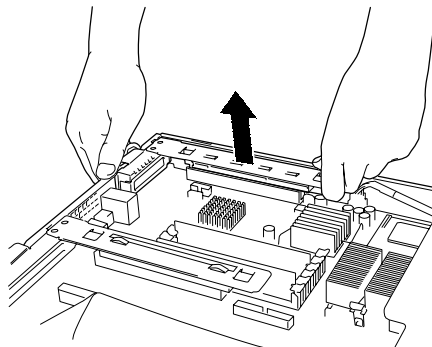
Riser card slot
(Dedicated to low-profile PCI boards)
Slot number: 1C
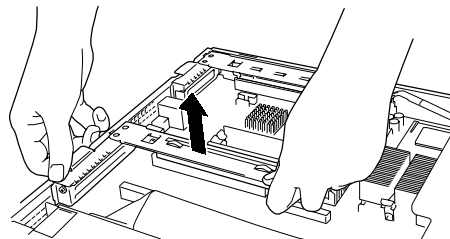
Riser card slot
(Dedicated to full-height PCI boards)
Slot number: 1B

5. Remove the screw from the riser card, and remove the extension slot cover.

> **NOTE:** Keep the removed extension slot cover for future use.

Extension slot cover
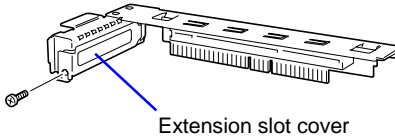
6. Install the PCI board on the riser card.

   Align the PCI board terminal section with the riser card slot, and firmly push the PCI board until it is fully seated.

Insert the end of the PCI board bracket in the frame slot of the riser card.
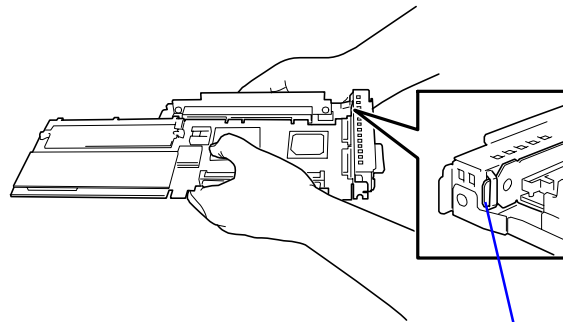
> **IMPORTANT:**
>
> - Do not touch the terminals of the riser cards and PCI boards with your bare hand. Fingerprints and dust left on them cause the server to malfunction.
>
> - If you are unable to install a PCI board correctly, remove it, and then install it again. Be careful not to apply excess force to a PCI board or riser card. Doing so may damage the card.

> **NOTE:** Confirm that the end of the PCI board bracket is inserted in the frame slot of the riser card.

7. Secure the PCI board with the screw you removed in step 6.

> **IMPORTANT:** This step is to protect the terminals of the riser card from dust or fingerprints. Dust and fingerprints left on them cause the server to malfunction.
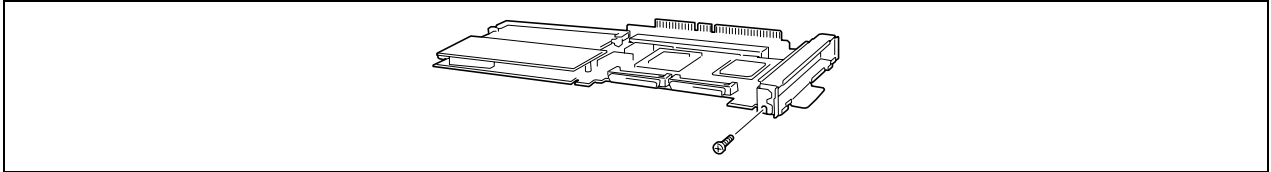
8. Insert the riser card into the slot on the system board.

Align the riser card terminal section with the slot on the system board, and firmly push the riser card until it is fully seated.

> **NOTE:** There are catches on the riser card frame that are used to secure the riser card to the cabinet. When inserting the riser card, confirm that the catches are correctly fit into the holes on the rear of the cabinet. After the insertion, push the riser card with your fingers until you cannot see any part of the riser card terminal section. The riser card is now fully seated in the slot.
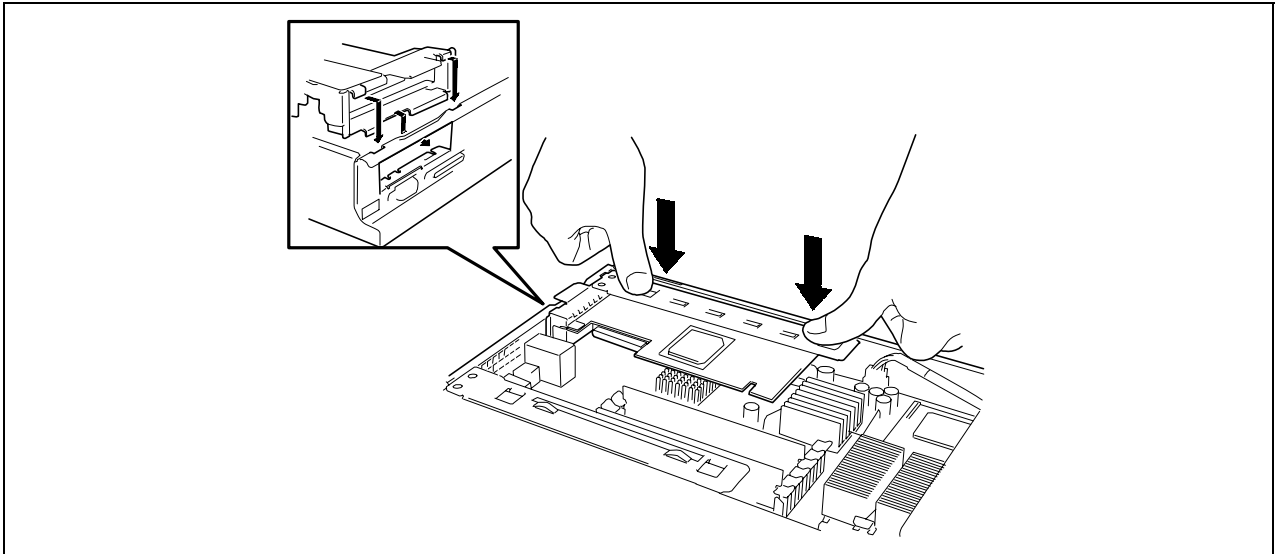
9. Install the components you removed previously.

10. Verify that POST displays no error messages.

    If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 6.

11. Select "Yes" for [Advanced] → [Reset Config Data].

    This setting is required to change the hardware configuration data. See Chapter 3 for details.

12. Start the BIOS configuration utility in the installed card, and set up the card.

    Presence/absence of the utility and the start and operation methods depend on the card. For details, see the manual provided with the card. If a PCI board (e.g., a disk array controller, SCSI controller, or LAN card) with a bootable device connected is additionally installed, the boot priority is changed to the default. After the additional installation, start the BIOS setup utility, select [Boot] → [Boot Device Priority], and set the new boot priority. (See Chapter 3.)

Removal

Remove a PCI board in reverse order of the installation steps. After the removal, start the BIOS setup utility, select [Boot] → [Boot Device Priority], and set the new boot priority. (See Chapter 3.)

Disk Array Controller Board

The disk array controller board is an optional PCI board provided to improve data reliability.

Installing the disk array controller board allows you to use hard disks in the device bays of the server and those in the optional expansion disk cabinet in the disk array configuration.

IMPORTANT:

- The disk array controller board is extremely sensitive to static electricity. Make sure to touch the metal frame of the Server to discharge static electricity from your body before handling the disk array controller board. Do not touch the disk array controller board terminals or on-board parts by a bare hand or place the disk array controller board directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.

- Making hard disks in the disk array configuration or changing the RAID level initializes hard disks. If the hard disk to be configured in the array has your valuable data stored, make sure to make a backup copy of the data in another hard disk before installing the disk array controller board and configuring the array.

- The disk array configuration requires at least two hard disks.

- Use hard disks of the same capacity and performance (e.g., revolution) for each pack to configure them in the array.

- When connecting a disk array controller, start the BIOS SETUP utility, select [Boot] $\rightarrow$ [Hard Disk Drives], and set the 8th priority or earlier for the controller. If the 9th priority or later is set, the system is unable to start the disk array controller configuration menu.

NOTES:

- Before installing a disk array controller board, start the SETUP utility, select [Advanced] $\rightarrow$ [PCI Configuration], and confirm that [Enabled] is set for the parameter [PCI Slot xx ROM] (xx: PCI slot number).

- A disk array configuration of RAID1, RAID5, or RAID0+1 increases disk reliability. However, the actually available capacity becomes smaller than the total hard disk capacity in the disk array configuration.

Installation

See "PCI Board" for the installation of a disk array controller.

> **IMPORTANT:**
>
> - A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.
>
> - If a disk array controller is installed in two PCI slots "1C" (for a low-profile PCI board) and "1B" (for a full-height PCI board), the system is unable to start through the disk array connected to the disk array controller installed in PCI slot "1B."
>
> - In the following instance, the provided LED relay cable cannot be connected and the access lamp that indicates the status of access to the internal hard disk drives does not function:
> The internal hard disk drives are used in a disk array configuration by installing the disk array controller on the riser card dedicated to low-profile PCI boards.
>
> - In the following instance, the provided LED relay cable cannot be connected and the access lamp that indicates the status of access to the internal hard disk drives does not function:
> The disk array controller is installed, and the internal hard disk drives are connected to channel 1 of the disk array controller. To solve the above problem, connect the internal hard disk drives to channel 0.

Removal

Remove a disk array controller board in reverse order of the installation steps.

Use of internal hard disk drives in a disk array configuration

To use the internal hard disk drives in a disk array configuration in the server containing a disk array controller board, reconnect the SCSI cables and LED cables on the system board.

The internal hard disk drive interface is connected to the SCSI connector on the system board at shipment.
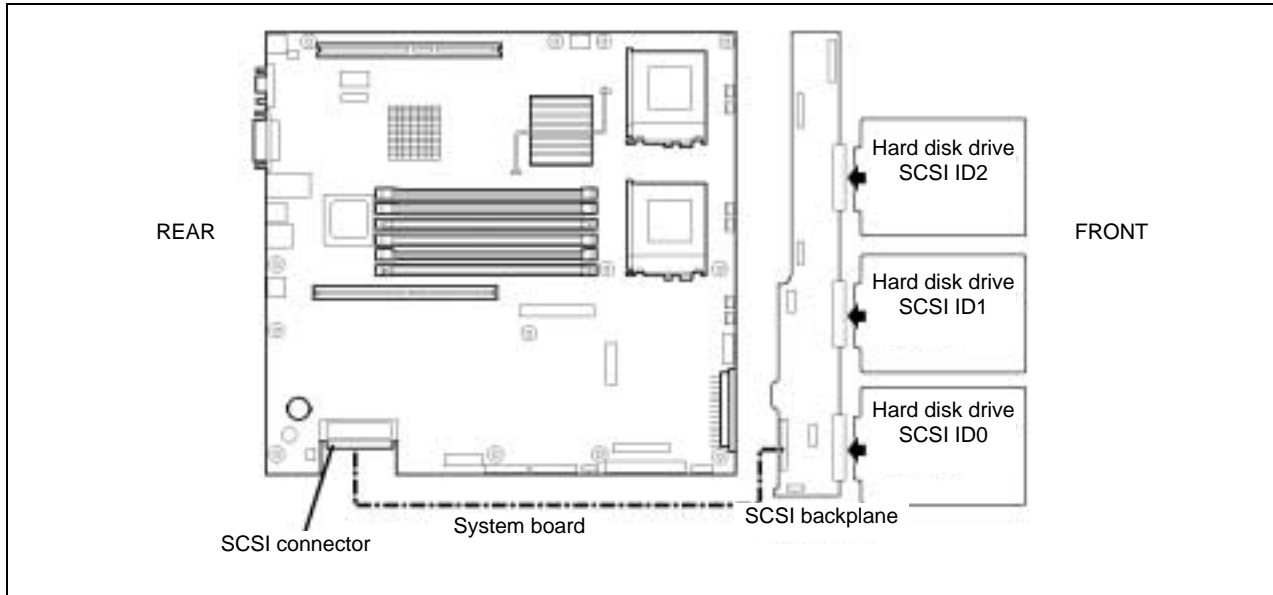
- Forming of the SCSI cable

  To connect a disk array controller, use the SCSI cable connected to the system board. In this case, the SCSI cable needs to be formed. The following shows the cable forming at shipment and how to form the SCSI cable when it is connected to the disk array controller. (The solid lines indicate lines for valley fold, and the broken lines indicate lines for mountain fold.)

Cable forming for connecting internal hard disk drives to the Mylex AcceleRAID 160 disk array controller installed on the riser card dedicated to low-profile PCI boards
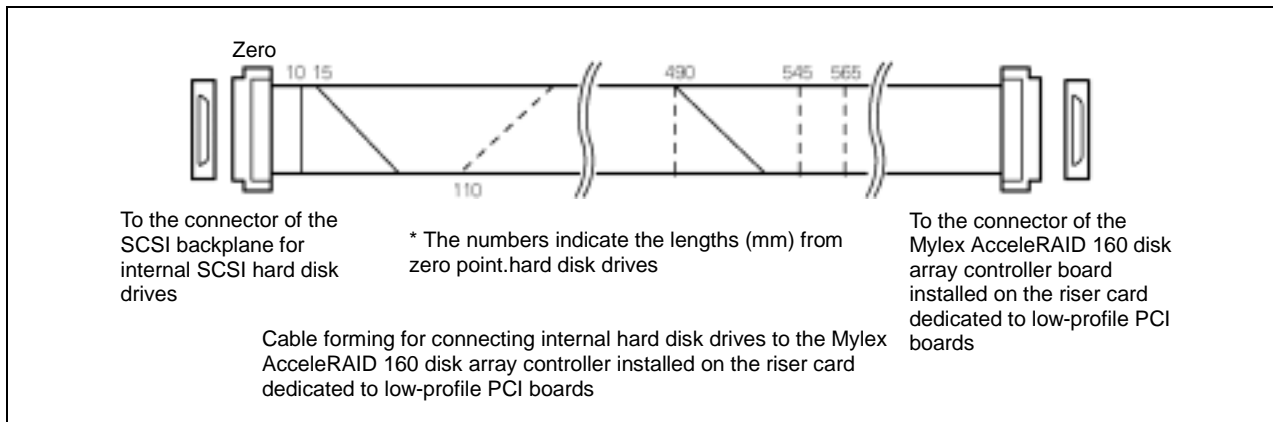
■ SCSI cable connection

To use the internal hard disk drives in a disk array configuration, disconnect the SCSI cable from the SCSI connector on the system board, and connect it to the connector of the disk array controller board.

SCSI cable provided for a disk array

Standard SCSI cable

Low-profile type

With the Mylex AcceleRAID 160 disk array controller installed on the full-height riser card

If using the Mylex AcceleRAID 352 disk array controller, connect it to the connector on the rear of the server.

Standard SCSI cable (Do not run the cable on the power supply unit. Form the cable so that it runs under the board.)

Full-height type

IMPORTANT:

- To use the internal disk array drives in a disk array configuration by installing the Mylex AcceleRAID 160 disk array controller on the low-profile riser card, disconnect the SCSI cable from the system board and the SCSI backplane. Instead, connect them with the provided SCSI cable for a disk array configuration. The SCSI cable connected in the standard configuration is not long enough. See "Example of connecting the SCSI cable" below.

- Some disk array controller boards have more than one channel (connector). They may have connectors for internal connection and external connection. However, the connectors may be under exclusive specification in consideration of the internal connection of the disk array controller board. Make sure that each connector (channel) is for internal connection or external connection. For the connectors and channels, see the manual provided with the disk array controller board.

- Example of connecting the SCSI cable

  This section explains the procedure for connecting the internal hard disk drives to the Mylex AcceleRAID 160 disk array controller board installed on the riser card dedicated to low-profile PCI boards.

1. Form the provided SCSI cable for a disk array configuration according to "Forming of the SCSI cable."

2. Remove the FAN bracket, lifting up the front of the bracket.

   NOTE: Remove the bracket while making sure that the signal cable from the power supply unit that runs through the slit on the left side of the bracket is not caught.
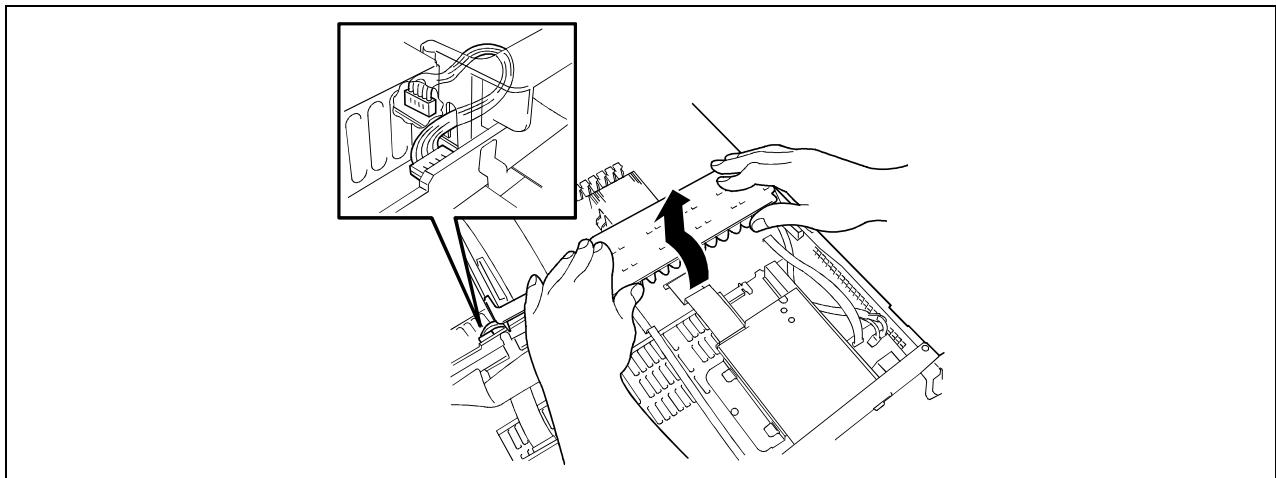
3. If an option is installed on the riser card for full-height PCI boards, remove the riser card.

4. Disconnect the SCSI cable from the system board.

5. Connect the connector on the backplane side of the SCSI cable you formed in step 1, to the SCSI backplane connector.

6. Attach the FAN bracket in reverse order of step 2.

    > **NOTE:** Put the SCSI cable through the tunnel under the full-length riser
    > card receiver of the bracket. Attach the bracket while making sure that
    > the cable is not caught in the bracket. Also make sure that the signal
    > cable from the power supply unit that runs through the slit on the left side
    > of the bracket is not caught when attaching the bracket.

7. Route the cable so that it runs avoiding the insulator mounted on the full-height riser card.

    If having removed the riser card for full-height PCI boards in step 3, lift up the connector on the disk array controller side of the provided SCSI cable for a disk array configuration, and connect the riser card to the connector. At this time, be careful not to damage the provided SCSI cable that runs under the riser card.

8. Connect the connector on the disk array controller side of the provided SCSI cable for a disk array configuration to the disk array controller.

9. Start the BIOS setup utility, select [Boot], and set the new boot priority.

■ LED relay cable connection

To indicate the status of access to the internal hard disk drives in a disk array configuration, connect the provided LED relay cable to the HDD LED connector on the system board and to the HDD LED connector of the disk array controller.

> **NOTE:** The LED relay cable is free from polarities. An end of the cable can be connected to either of the HDD LED connectors.

HDD LED connector

System board

Power*

LED Active*

LED Active   Power

* The pins are between
  the boards.

Mylex AcceleRAID 160 disk array controller

Mylex AcceleRAID 352 disk array controller
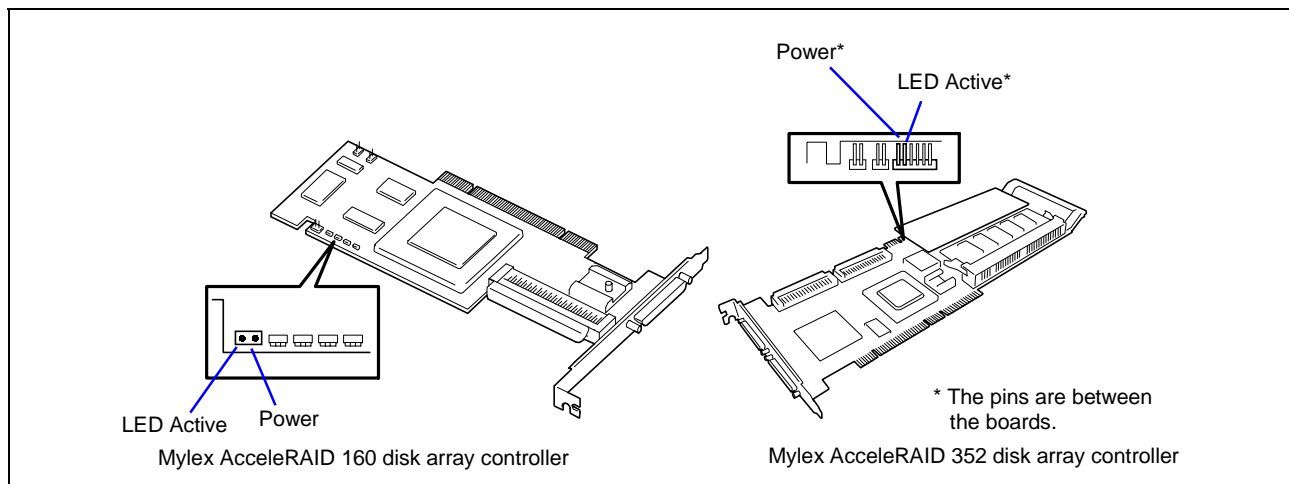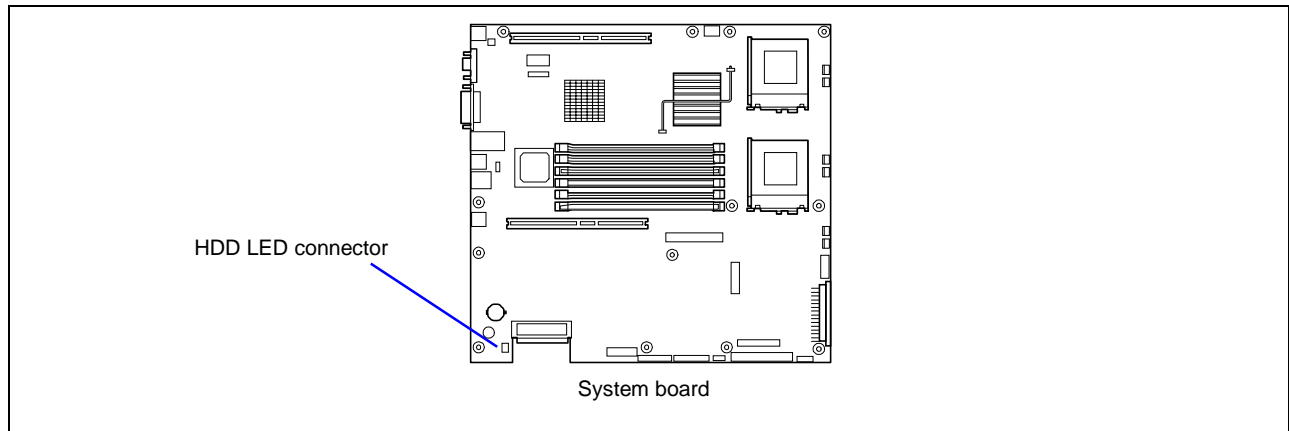
■ Disk array configuration of internal hard disk drives

Observe the following notes on configuring a disk array:

– The server must contain more than one SCSI hard disk drive having the same capacity
and the same rotational speed. (The minimum number of required disks depends on the
configuration of RAID (Redundant Arrays of Inexpensive [Independent] Disks).)

– Select/set a RAID level "RAID0", "RAID1", "RAID5", or "RAID0+1" of disk array
configuration.

When installing a system in an internal hard disk, you should use "Express Setup" to
perform all the procedures for RAID configuration, OS installation, and then OS setup.

Use Express Setup even when not installing a system. Start Express Setup, select [OS
Selection] → [Others]. The installer automatically performs all the procedures for RAID
configuration, maintenance partition setting, and then maintenance utility installation.

When making the setup in manual mode, use the RAID configuration utility in the chip
on the board. You can start the utility during execution of POST that automatically starts
immediately after you turn on the server power switch. For details, see the online
document in the EXPRESSBUILDER CD-ROM provided with the server. (The utility
varies depending on the disk array controller board.) For details on the data transfer rate,
RAID, and array configuration, see the manual provided with the disk array controller
board as well as the online document.

Use of a disk expansion unit in a disk array configuration

A disk expansion unit is an exclusive device that can install up to 14 hard disk drives. (The number of hard disk drives depends on the model.) The server containing a disk array controller board can connect one or two of these devices. For details on the number of devices connected, see the manuals provided with the disk array controller and disk expansion unit.

> **IMPORTANT:** A disk expansion unit is provided with no hard disk drives. You need to purchase hard disk drives separately.

After connecting the disk expansion unit, use the RAID configuration utility in the chip on the board to set the disk expansion unit in a disk array configuration (RAID0, RAID1, RAID5, or RAID0+1). (The utility varies depending on the board.) For details on settings and the setting methods, see the online document in the EXPRESSBUILDER CD-ROM provided with the server or the manual provided with the board.

While a disk expansion unit is set in a disk array configuration, you can use the "Auto Rebuild" feature of the disk array controller to restore data damaged if one of the hard disk drives installed in the disk expansion unit fails. (Replace the failing hard disk drive while the power is on. (Hot swapping))

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Appendix A

Specifications

Item		Express5800/120Rb-1	
CPU	Type	Intel® Pentium® III processor	Intel® Pentium® III processor-S
	Clock/Cache	1.0GHz/256KB	1.26GHz/512KB
	Number of processors	1	
	Maximum	2	
Chipset		Server Works Server Set III HE-SL	
Memory	Standard	256MB	
	Maximum	6GB (The standard DIMM must be replaced.)	
	Expansion unit	2 DIMMs (128MB×2/256MB×2/512MB×2/1024MB×2)	
	Expansion times	2 times	
	Memory module	SDRAM DIMM (Low Profile PC133 Buffered Type)	
	Error check	ECC	
Graphics (VRAM)		ATI RAGE XL (VRAM 8MB)	
Auxiliary input device	Floppy disk (standard)	3.5-inch drive × 1 *1	
	Hard disk (standard)	None	
	Hard disk (maximum)	219.6 GB (73.2 GB × 3)	
	CD-ROM (standard)	ATAPI interface × 1 (Load on tray type, x24 speed)	
Hard disk bay		3 slots	
Additional slot	PCI (64-bit)	1 slot	
	Low Profile PCI (64-bit)	1 slot	
LAN interface		100Base-TX/10Base-T (2 ports)	
External interface	Keyboard/mouse	MINI DIN 6-pin connector (1 port)	
	USB	4-pin (4 ports)	
	Serial	RJ-45 (1 port))	
	Network	RJ-45 (2 ports)	
	Display	MINI D-sub 15-pin (1 port)	
	SCSI	Ultra 160 SCSI (1 port)	
Cabinet design		Rack-mount type (1U)	
External dimensions		483 (width) × 44 (height) × 660 (depth) mm	
Weight		14 kg (Max.)	
Power supply		100 to 120 VAC ±10%, 200 to 240 VAC ±10%, 50/60 Hz ±1 Hz	
Power consumption (maximum)		240 VA, 235 W	
Environmental requirements	Temperature	10 to 35°C	
	Humidity	20 to 80% RH (no condensation)	
Others		EXPRESSBUILDER supported, ESMPRO provided in the standard configuration	

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Appendix B

Interrupt Requests (IRQs)

The factory-set interrupt requests are listed below. Find an appropriate interrupt request from the list below to install an optional device.

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	8	Real-time clock
1	Keyboard	9	PCI/SCI
2	Cascaded connection	10	PCI
3	COM2 serial port (PCI)	11	ESMINT/PCI
4	COM1 serial port (PCI)	12	Mouse
5	PCI/LPT2 parallel port	13	Numeric processor
6	Floppy disk	14	Primary IDE (CD-ROM drive)
7	(PCI/LPT1 parallel port)	15	–

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Appendix C

Installing and Configuring Windows 2000 and Windows NT 4.0

WINDOWS 2000

This appendix contains supplemental instructions needed to install and configure hardware and software used with the Microsoft Windows® 2000 Operating System. This information is intended to supplement the more detailed procedural documents available from Microsoft. This information is not intended to be the central source of installation and configuration information for your system. Read this entire appendix along with Microsoft's Windows® 2000 Setup procedures before starting the installation process.

> **IMPORTANT:** Read the System Release Notes for the latest system information before attempting to install Windows 2000 Operating System on your system.

Device Drivers

The drivers required for the devices listed in the table below are located on the EXPRESSBUILDER CD that is included with your system. To create the required diskettes, select "Tools" on the EXPRESSBUILDER CD menu.

> **IMPORTANT:** When creating the required diskettes from the EXPRESSBUILDER CD make sure you use the drivers required for the devices on your specific system.
>
> Always read the information in the release notes or inserts, included with any options for they supersede the information in this guide.

Supported Device	Required Driver Media*
SCSI RAID Controller	Windows 2000 OEM Diskette*
System Board	Windows 2000 NEC Update Module**

*Diskette generated from the NEC EXPRESSBUILDER CDROM
**Run this application from the EXPRESSBUILDER CDROM; diskette not required

Installation Assumption

The installation and configuration instructions in this appendix assume the following:

- You have properly completed the hardware installation.

- You have run the BIOS Setup Utility to check system configuration.

  > **IMPORTANT:** To successfully install Windows 2000 on your system, PnP must be enabled in your system BIOS.

- You will be installing Windows® 2000 Operating System from the CD-ROM media.

  > **IMPORTANT:** If you have the optional disk array controller preinstalled on your system, it was preconfigured at the factory. Refer to your system's *User's Guide* and to the *RAID Installation Guide* and the *Disk Array Controller Installation Guide and User's Manual* for additional information on this option card. If you need to change the RAID level from the factory setting, you must change the setting before installing the operating system.

Preparation

Before starting the installation procedure, you need to obtain certain information for use during the installation. The table below lists the information you need in advance for the installation. It is recommended that you obtain the information from your server administrator and record it in the table before starting.

After completing the installation, you might want to use the Windows 2000 Control Panel to configure additional devices or Windows 2000 services and facilities.

Item	Information Required	Enter Your Information Here
1	Name of the Windows 2000 user.	
2	Name of the licensed organization.	
3	Product Key number for Microsoft Windows 2000 Server Software. This number is on the Certificate of Authenticity included with your Windows 2000 Server Software.	
4	Name that you assign to the server.	
5	Obtain your network configuration information. For example, if network settings are to be customized: TCP/IP Configuration values such as IP address values, DNS and WINS address resolution facilities, DHCP Relay and Routing configuration values.	
6	The name of any Administrative Domain or Workgroup that this server is to be a member of.	

Installing Microsoft Windows® 2000 Operating System

Use the following procedure to set up and perform a clean Windows 2000 Operating System installation on your server.

1. Insert the Windows 2000 CD into the CD-ROM drive and boot your system by pressing CTRL+ALT+Delete.

   > **IMPORTANT***:* Perform Steps 2 through 6 if a RAID controller is installed in your server; go to Step 7 if your server does not include a RAID controller.

2. While the message "Setup is inspecting your computer's hardware configuration" or a solid blue background is displayed on the screen, press the F6 key.

   > **IMPORTANT:** There is no visible indication on the screen when the F6 key has been pressed.

3. When the following message is displayed, press S.

   "Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter". Currently, Setup will load support for the following mass storage devices.

4. When the following message is displayed, select "Other" and then press Enter.

   Select the SCSI Adapter your want from the following list, or select "Other" if you have a device support disk provided by an adapter manufacturer

5. Insert the "Windows 2000 OEM-DISK" diskette into the floppy drive, and press Enter. A list of mass storage devices is displayed.

6. Select the RAID disk array controller installed in your server from the list of mass storage devices.

7. Follow the messages on the screen to continue to install.

   > **IMPORTANT:** Please consult the Microsoft Windows 2000 Installation Guide for more extensive installation procedures.
   >
   > For LAN adapter driver installation, *see Installing LAN Adapter Drivers* later in this appendix.

8. After installing Windows 2000, logon to the system using the administrator account or other account, which is a member of the Administrator's group.

9. Insert the EXPRESSBUILDER CD and run the "Windows 2000 NEC Update Module" for the Express5800 120Rb-1 Server.

> **IMPORTANT:** If you change the configuration of the system (by adding or removing hardware or operating system software components), or repair the system, you must run the Windows 2000 NEC Update Module again.

Installing LAN Adapters

The following section includes special driver installation instructions for the Intel PRO/100+ LAN adapter used in your system.

Driver Installation for the Intel PRO/100+ LAN Adapter

The PRO/100+ driver is initially installed during the installation of Windows 2000 and upgraded when you run the "Windows 2000 NEC Update Module, see "Installing Microsoft Windows® 2000 Operating System" found earlier in this appendix. In order to utilize the PRO/100+ LAN adapter "teaming features," use the following procedure to install "PROSET II for Windows 2000."

1. Power on, start Windows 2000, and log on.

2. Insert the EXPRESSBUILDER CD into the CDROM drive. The "Start" Menu displays.

3. Select "Drivers and Utilities" from the "Start" Menu.

4. Select INTEL.

5. Select and run "PROSET II for Windows 2000."

Driver Installation for the ATI RAGE XL Display Adapter

To take full advantage of the on-board ATI RAGE XL display adapter, perform the following driver installation procedure:

1. Power on, start Windows 2000, and log on.

2. Insert the EXPRESSBUILDER CD into the CDROM drive. The "Start" Menu displays.

3. Select "Drivers and Utilities" from the "Start" Menu.

4. Select ATI.

5. Select and run "Rage XL Driver for Windows 2000."

Windows NT 4.0

This appendix contains supplemental instructions needed to install and configure hardware and software used with the Microsoft Operating System Windows NT Release 4.0. This information is intended to supplement the more detailed procedural documents available from Microsoft. This information is not intended to be the central source of installation and configuration information for your system. Read this entire appendix along with Microsoft's Windows NT 4.0 installation procedures before starting the installation process.

> **IMPORTANT**: Read the System Release Notes for the latest system information before attempting to install Windows NT 4.0 Operating System on your system.

Device Drivers

The drivers required for the devices listed in the table below are located on the EXPRESSBUILDER CD. To create the required diskettes, select "Tools" on the EXPRESSBUILDER CD. This table lists the required diskette labels.

> **IMPORTANT:** When creating the required diskettes from the EXPRESSBUILDER CD make sure you use the drivers required for the devices on your specific system.
>
> Always read the information in the release notes or inserts, included with any options for they supersede the information in this guide.

Device	Required Driver Media*
SCSI or SCSI RAID Controller	Windows NT 4.0 OEM - Disk #1*
Network Controller	Windows NT 4.0 OEM - Disk #2*
System Board	Windows NT 4.0 NEC Update Module**
Video	RAGE XL Driver for Windows NT 4.0**

 *Diskette generated from the NEC EXPRESSBUILDER CDROM
 **Run this application from the EXPRESSBUILDER CDROM; diskette not required

Configuring RAID

If you have a Disk Array Controller preinstalled on your system, it was preconfigured at the factory. Refer to your system's *User's Guide* and to the *AcceleRAID Installation Guide* and the *Disk Array Controller Installation Guide and User's Manual* for additional information on this option card. If you need to change the RAID level from the factory setting, you must change the setting before installing the operating system.

Installing Microsoft Windows® NT 4.0 Operating System

Use this procedure to install Windows NT 4.0 Operating System.

1. Insert the Windows NT CD into the CD-ROM drive and boot your system by powering on the system.

2. While the message "Setup is inspecting your computer's hardware configuration" or a solid blue background is being displayed on the screen, press the F6 key.

   > **IMPORTANT:** There is no visible indication on the screen when the F6 key has been pressed.

3. When the following message is displayed, press S.

   "Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter". Currently, Setup will load support for the following mass storage devices.

4. When the following message is displayed, select "Other," then press Enter.

   Select the SCSI Adapter your want from the list, or select "Other" if you have a device support disk provided by an adapter manufacturer

5. Insert the "Windows NT 4.0 OEM-DISK #1" diskette into the floppy drive, and press Enter.

6. A list of mass storage devices is displayed.
   Select "Adaptec Ultra160/m Family PCI SCSI Controller", and press Enter.

7. When you are using a disk array controller, select the appropriate "device controller" from the above list of mass storage devices.

8. Follow the message on the screen to continue to install.

   > **IMPORTANT:** Please consult the Microsoft Windows NT 4.0 Installation Guide for more extensive installation procedures.

   > **IMPORTANT:** For LAN adapter driver installation, *see Installing LAN Adapter Drivers* later in this appendix.

9. After installing Windows NT, logon to the system using the administrator account or other account, which is a member of the Administrators group.

10. Insert the EXPRESSBUILDER CD and run the Windows NT 4.0 NEC Update Module.

> **IMPORTANT:** If you change the configuration of the system (by adding or removing hardware or operating system software components), or repair the system, you must run the system update again.

Installing LAN Adapter Drivers

The following section includes special driver installation instructions for LAN adapters used in your system.

Driver Installation for the Intel PRO/100+ LAN Adapter

The PRO/100+ driver will be installed during the installation of Windows NT, see "Installing Microsoft Windows® NT 4.0 Operating System" earlier in this appendix.

Use the following procedure to install the LAN adapter driver on your server:

1. During the Windows NT installation when the dialog box displaying the message "To have setup search for a Network Adapter, click Start Search button" opens. Click "Select from List".

2. In the "Select Network Adapter" dialog box 1, Click "Have Disk". The "Insert Disk" dialog box opens.

3. Insert the floppy disk named "Windows NT 4.0 OEM-DISK #2" into the floppy disk drive.

4. Enter "A:\I550PM" and click on [OK].

5. The "Select OEM Option" dialog box opens.
   Select "Intel(R) PRO Adapter" and click on [OK].

6. Click on [NEXT].

7. You may need to specify network information depending on the protocol you use. Follow the message on the screen to continue the Windows NT installation.

Driver Installation for the ATI RAGE XL Display Adapter

To take full advantage of the on-board ATI RAGE XL display adapter, perform the following driver installation procedure:

1. Power on, start Windows NT, and log on.

2. Insert the EXPRESSBUILDER CD into the CDROM drive. The "Start" Menu displays.

3. Select "Drivers and Utilities" from the "Start" Menu.

4. Select ATI.

5. Select and run "Rage XL Driver for Windows NT."

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Appendix D

Equipment Log

Use the following hardware and software tables to record information when modifying your system.

Hardware

Main Unit						
	Model name		Serial No.		Date Installed	
CPU						
#1	Clock		Serial No.		Date Installed	
#2	Clock		Serial No.		Date Installed	
Memory						
#1A, #1B	Size		Serial No.		Date Installed	
#2A, #2B	Size		Serial No.		Date Installed	
#3A, #3B	Size		Serial No.		Date Installed	
Monitor						
	Type		Model name		Serial No.	
					Date Installed	
Hard Disk						
ID0	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID1	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID2	Type			Serial No.		
	Capacity			Date Installed		
	Type number					

PCI Slot low-profile (1C)						
	Model name				Serial No.	
					Date Installed	
PCI Slot full-height (1B)						
	Model name				Serial No.	
					Date Installed	
Additional Cabinet for Disk						
	Model name				Serial No.	
					Date Installed	
External Peripheral Device 1						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 2						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 3						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 4						
	Model name				Serial No.	
	Manufacturer				Date Installed	

Software

Firmware version	
OS Application of RUR media	Name: Version: ☐ Apply Name: Version:
File system	☐ FAT ☐ HPFS ☐ NTFS ☐ Others ( )
Bundled software installed	
Licensed software installed	
Application running when a failure occurred	

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Glossary

A

AC

(Alternating Current) The type of current available in wall outlets. All computers must convert alternating current to direct current to operate. See also DC.

address

A label, name, or number that identifies a location in computer memory.

ASCII

(American Standard Code for Information Interchange) A standard number assigned to each of the alphanumeric characters and keyboard control code keys to enable the transfer of information between different types of computers and peripherals.

B

backplane slot

A connector on the backplane board in desktop computers and expansion boxes that allows you to install circuit cards.

backup

A copy of data for safe-keeping. The data is copied from computer memory or disk to a floppy disk, magnetic tape, or other media.

backup battery

The battery in your computer that maintains the real-time clock and the configuration information when the computer's power is removed.

base memory

An area of memory between 0 and 640 kilobytes.

baud rate

The speed with which data is transmitted during serial communication. The computer's operating system and software program must be configured for the same baud rate as the communication device, such as a serial printer. See also bps.

BIOS

(Basic Input/Output System) A program stored in flash EPROM or ROM that controls the keyboard, disk drives, video monitor, and other devices. See also flash EPROM, EPROM, and ROM.

bit

Derived from BInary digiT, a bit is the smallest unit of information a computer handles. See also byte.

BMC

(Baseboard Management Controller) Contains all of the server management functions. One major function of the BMC is to monitor system management events and log their occurrence in the System Event Log (SEL).

boot

The process of loading the operating system into memory.

bps

(bits per second) The number of bits transferred in one second during serial communication, such as modem transmission.

byte

A group of eight bits.

C

cache memory

A very fast, limited portion of RAM set aside for temporary storage of data for direct access by the microprocessor.

CD-ROM drive

(Compact Disk ROM drive) A type of mass storage device that reads information from a compact disk.

Centronics port

An industry standard parallel port. See also parallel port.

CGA

(Color Graphics Adapter) A type of video display system that provides low-resolution text and graphics on TTL monochrome and color monitors.

CMOS

(Complimentary Metal-Oxide Semiconductor) A type of low-power integrated circuit used in computers. See also TTL.

COM1 or COM2

The name you can assign a serial port to set or change its address. See also serial port.

command

An instruction that directs the computer to perform a particular operation.

configuration

The way in which a computer is set up to operate. Some configurable options include CPU speed, serial port designation, and memory allocation.

CPU

(Central Processing Unit) See microprocessor.

CRT

(Cathode-Ray Tube) The type of video display used in monitors for desktop computers.

D

DC

(Direct Current) The type of current available in the rechargeable battery packs used in portable computers. See also AC.

default

The factory setting your computer uses unless you instruct it otherwise. For example, when powering up, the computer will boot from the default drive.

density

The capacity of information (bytes) that can be packed onto a storage device, such as a floppy disk.

device driver

A software program that a computer must use to recognize and operate certain hardware, such as a mouse or a video monitor.

disk drive

A device that stores data on a hard or floppy disk. A floppy disk drive requires a floppy disk to be inserted; a hard disk drive has a permanently encased hard disk.

DOS

(Disk Operating System) See operating system.

DRAM

(Dynamic RAM) See RAM.

E

ECC

(Error Checking and Correction) A method of detecting and correcting errors.

EEPROM

(Electrically Erasable Programmable Read-Only Memory) A type of memory device that stores password and configuration information.

EGA

(Enhanced Graphics Adapter) A type of video display system that provides medium-resolution text and graphics on TTL monochrome, color, and enhanced color monitors.

EMP

The Emergency Management Port (EMP) provides an interface to the console manager. This interface allows remote server management via a modem or direct connection.

EMS

(Expanded Memory Specification) A method of accessing memory beyond the 640K limit of DOS by exchanging data in and out of main memory at high speeds. Some software requires EMS to operate.

EPROM

(Erasable Programmable Read-Only Memory) A type of memory device that is usually used to store system BIOS code. This code can be erased with ultraviolet light, but is not lost when the computer is powered off. See also flash EPROM and ROM.

expansion slot

See backplane slot.

extended memory

The protected memory above 1M that is directly accessible by the microprocessor through certain utilities and operating systems.

F

flash EPROM

A type of memory device that is usually used to store system BIOS code. This code can be replaced with updated code from a floppy disk, but is not lost when the computer is powered off. See also EPROM and ROM.

floppy disk drive

See disk drive.

format

The process used to organize a hard or floppy disk into sectors so it can accept data. Formatting destroys all previous data on the disk.

FRB (Fault Resilient Boot

A server management feature. FRB attempts to boot the system using the alternate processor or DIMM.

G

(Gigabyte)

1,073,741,824 bytes. See also byte.

H

hard disk drive
See disk drive.

hardware
The physical parts of your computer, including the keyboard, monitor, disk drives, cables, and circuit cards.

hot swap
A method used to insert or remove SCSI disk drives into or from an operating bus. This method is typically used in RAID subsystems. When used in non-RAID subsystems the operating system must typically be restarted.

I

IC
(Integrated Circuit) An electronic device that contains miniaturized circuitry.

IDE
(Integrated Drive Electronics) A type of hard disk drive with the control circuitry located inside the disk drive rather than on a drive controller card.

interface.
A connection between the computer and a peripheral device that enables them to exchange data. See also parallel port and serial port.

ISA
(Industry Standard Architecture) An industry standard for computers and circuit cards that transfer 16 bits of data at a time.

J

jumper
A small electrical connector used for configuration on some computer hardware.

K

(Kilobyte)
1,024 bytes. See also byte.

L

LAN
(Local Area Network) A group of computers linked together within a limited area to exchange information.

LCD

(Liquid Crystal Display) The type of video display used in portable computers.

LED

(Light-Emitting Diode) A small electronic device that glows when current flows through it.

LPT1 or LPT2

The name you can assign a parallel port to specify its address. See also parallel port.

LVD

Super-fast Ultra 2 SCSI Low Voltage Differential (LVD) Parallel SCSI Interface. A new SCSI interface that provides greater I/O bandwidth, device connectivity, data reliability, and longer cable lengths for Ultra2 SCSI hard disk drives. Note that in order to achieve LVD performance all devices including cable, controller, and drive must support LVD.

M

(Megabyte)

 1,048,576 bytes. See also byte.

memory

The circuitry in your computer that stores data and programs. See also EMS, extended memory, RAM, and ROM.

microprocessor

The integrated circuit that processes data and controls the basic functions of the computer.

modem

A device used to exchange information with other computers over telephone or data lines.

module

A circuit board that plugs into a dedicated connector on the system board in your computer.

mouse

A small input device that you guide on a flat surface to control the cursor movement and operation of the computer when using certain software programs.

N

NVRAM

(Nonvolatile RAM) A type of RAM that retains its contents even after the computer is powered off. This memory stores EISA configuration information. See also RAM and SRAM.

O

operating system
A set of programs that provides the interface between other software programs and the computer.

P

parallel port
The connector on the back of your computer that allows the transfer of data between the computer and a parallel device, such as a parallel printer.

partition
The process of dividing the storage space on a hard disk into separate areas so that the operating system treats them as separate disk drives.

password
A security feature that prevents an unauthorized user from operating your computer. See also EEPROM.

PCI
Peripheral Component Interconnect. PCI is a high-performance peripherals I/O bus supporting data transfers of up to 528MB per second.

Pentium
A type of microprocessor, with a built-in math coprocessor, cache memory, and memory and bus controllers, that processes and communicates 32 bits of data at a time. This microprocessor also contains power management capabilities.

peripheral
A device connected to and controlled by the computer, such as an external disk drive or a printer.

pixel
The smallest element that is visible on a video display. The resolution of a video display system is measured in pixels.

PnP
(Plug-n-Play) Plug-and-play is the ability to plug a device into a computer and have the computer recognize that the device is there. The user doesn't have to tell the computer.

POST
Power-On-Self-Test.

R

RAM

(Random-Access Memory) A temporary storage area for data and programs. This type of memory must be periodically refreshed to maintain valid data, and is lost when the computer is powered off. See also NVRAM and SRAM.

real-time clock

The IC in your computer that maintains the time and date.

ROM

(Read-Only Memory) A type of memory device that usually is used to store system BIOS code. This code cannot be altered and is not lost when the computer is powered off. See also BIOS, EPROM, and flash EPROM.

RS-232C port

An industry standard serial port. See also serial port.

S

SAF-TE

(SCSI Accessed Fault Tolerant Enclosure) A specification for monitoring the state of the drives and enclosure environment (fan, power supply, temperature, etc.) using the SCSI bus to indicate faults.

save

To store information on a floppy disk, hard disk, magnetic tape, or some other permanent storage device.

SCSI

(Small Computer System Interface) An industry standard interface that provides high-speed access to tape drives, hard disk drives, and other peripheral devices.

SEL

(System Event Log) A record of system management events. The information stored includes the name of the event, the date and time the event occurred and data pertinent to the event. Event data may include POST error codes that reflect hardware errors or software conflicts within the system.

serial communication

Information sent sequentially, one bit at a time.

serial port

The connector on the back of your computer that allows the transfer of data between the computer and a serial device, such as a mouse, a modem, or a serial printer.

setup program

The program that you use to change the configuration of some ISA desktop and notebook computers. This program also contains information about the hardware in the computer.

software

Programs with specific functions, such as word processing, data base management, communications, and operating system.

SRAM

(Static RAM) A temporary storage area for data and programs. This type of memory does not need to be refreshed, but it is lost when the computer is powered off. See also NVRAM and RAM.

SVGA

(Super VGA) A type of video display system that provides very high-resolution text and graphics on analog color monitors.

system board

The main circuit board in your computer. It contains most of the connectors and ports.

T

tape drive

A type of storage device using magnetic tape.

TTL

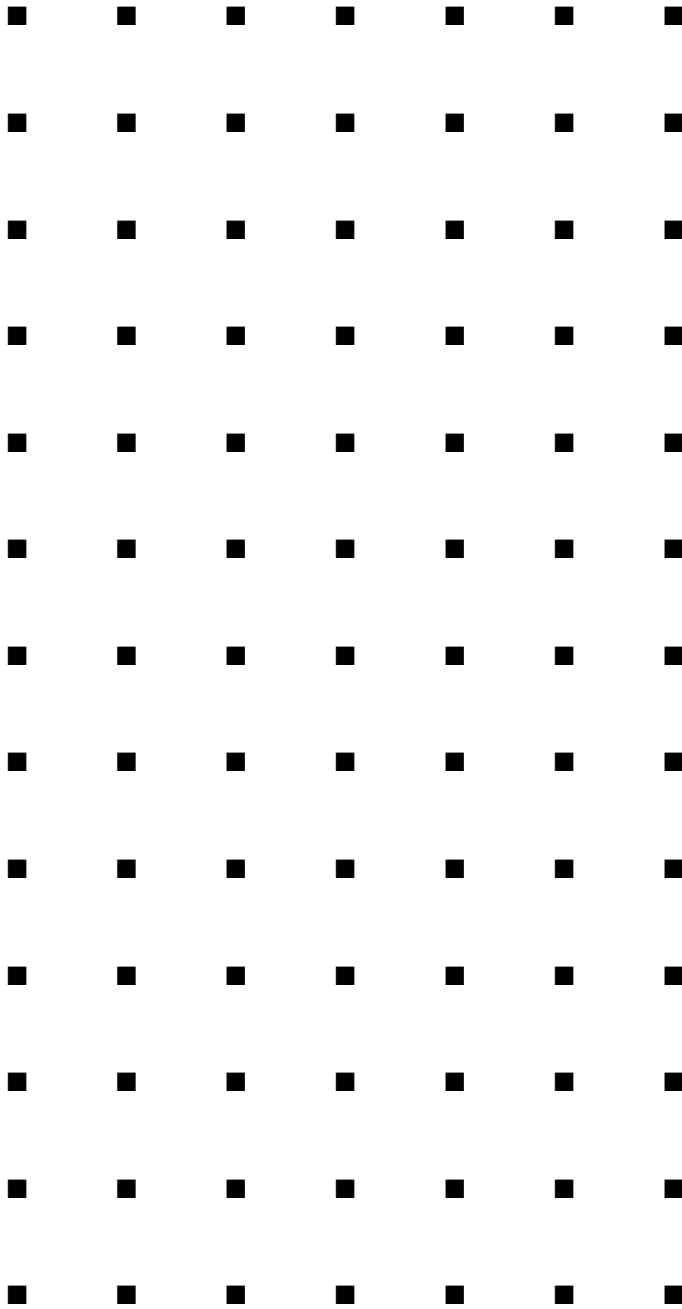(Transistor-Transistor Logic) A type of integrated circuit used in computers. See also CMOS.

U

ultra 160/m SCSI

Ultra 160/m is a parallel SCSI interface based on Ultra3 SCSI technology. This interface features data transfer speeds up to 160MB/second (double-edge clocking), cyclical redundancy checking (CRC) providing higher levels of data reliability, and domain validation that detects the configuration of the SCSI bus and automatically tests and adjusts the SCSI bus transfer rate to optimize interoperability. Note that the Ultra 160/m uses the standard Ultra2 LVD cabling and termination, making it backward compatible for easy implementation.

V

VGA

(Video Graphics Array) A type of video display system that provides high-resolution text and graphics on analog color monitors.

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